Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

UNITED STATES
DEPARTMENT OF AGRICULTURE
LIBRARY

BOOK NUMBER Reserve
1.9
P6917
v.11
1919

566309

GPO 8—7871

S6917
Reserve

LIBRARY
RECEIVED
SEP 19 1946
U. S. DEPT. OF AGRICULTURE

CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry; U.S. Dept. of Agriculture
(NOT FOR PUBLICATION)

******

Vol. II January 20, 1919. No.1
Project Issue
******

PERSONNEL (AGRONOMIC PROJECTS)

C. R. Ball was in Baltimore on January 8 and 10 for the purpose of conferring with college and experiment station officials on cooperative experimental work in 1919, and to hear the presentation of the Department's crop program for the coming year.

Professor Manley Champlin, of South Dakota College of Agriculture, was in Washington from January 7 to 18 to write the annual report on the cooperative work at the Brookings, Highmore, Eureka, and Cottonwood experiment stations.

Ross R. Childs, of the cereal experimental work in Georgia, and who has just received his discharge from military service, has been assigned temporarily to special work in connection with the emergency extension of rice growing in the South. He will determine areas in the southern States where rice can be grown without irrigation, and will work among farmers, merchants, and others in those States to stimulate an increased production of rice. Just before leaving Mr. Childs received hearty congratulations on his engagement to a former stenographer of this office, Miss Medora Field, of Rome, Ga., whom he met in the office in 1916.

C. H. Clark, Assistant Agronomist in charge of Flax Investigations, left Washington on January 15 for a trip to the West in the interest of stimulating flax acreage in 1919.

Dr. H. V. Harlan was in Baltimore on January 7, 8, and 9, for the purpose of conferring with college and station officials from the States of the upper Mississippi Valley concerning proposed cooperation in stabilizing barley acreage for 1919 through emphasizing the value of barley as a profitable yielder and an excellent feed crop.

John H. Martin, who during the past year has been Superintendent of the Harney County Substation, at Burns, Oreg., has resigned his position there to become assistant in Western Wheat Investigations, with headquarters at Washington, D. C. It is expected that Mr. Martin soon will go to Corvallis, Oreg., for conference with the college and experiment station officials and then will come to Washington during the last week in January.

Stephen M. Spangler has been appointed Field Assistant, effective December 11, in connection with the cooperative cereal experiments at the

Agricultural Experiment Station, Knoxville, Tenn.

L. J. Stadler recently received his discharge from military service and has returned to Columbia, Mo., where he took charge of the cooperative cereal experiments at Missouri Agricultural Experiment Station on December 30.

PERSONNEL (PATHOLOGIC PROJECTS)

D. C. Babcock, has resigned as Collaborator in barberry eradication and also as Assistant Botanist at Ohio State Experiment Station.

F.F. Blaine, who has been assisting in barberry eradication since the completion of last year's smut control work in the eastern States, has returned to Washington to assist in planning the smut control campaign for next spring.

Lytton Calrow has been appointed Assistant Pathologist, effective January 10, to assist in the barberry eradication campaign. Mr. Calrow is a graduate of Michigan Agricultural College and has just received his discharge from the Army in which he has served as Second Lieutenant in Field Artillery.

E. C. Dobbs, G. W. Goodwin, and N. D. Hicks, Field Assistants in the smut control campaign in Alabama, have completed the work there and have resigned, effective December 31.

Anna E. Ehlers, Assistant Pathologist in the smut control campaign in California, resigned on January 7, to take up teaching.

James Godkin left on January 11 for the State Agricultural College of Colorado to assist Professor W. W. Robbins in inaugurating an extensive campaign for control of wheat and oat smut during the coming spring.

Professor G. N. Hoffer and J. R. Holbert, who are engaged in corn rot investigations conducted cooperatively by Purdue University and this office, were in Washington from January 6 to 8, inclusive, for conference on the research program for 1919.

Charles W. Hungerford, pathologist in charge of the Black and Stripe Rust project, arrived at the office on January 6 to complete a manuscript on his investigation of rust infection through cereal seeds.

Charles Raymond Hursh, who served in the smut control campaign during the spring and summer of 1918, has recently been discharged from the Army and has been reappointed as Assistant Pathologist, to assist in the barberry eradication campaign.

Ralph E. Kelley has been appointed Assistant Pathologist, effective January 10, for service in the barberry eradication campaign. He is a graduate of Michigan Agricultural College and has recently been [illegible] in the aviation service.

566309

B. A. Langenbacher, Assistant Pathologist in barberry eradication, arrived in Washington on January 6 for a few days' conference.

W. W. Mackie, Leader of the smut control campaign in California, has been in Washington since January 15 for conference.

James I. W. McMurphy who has been assisting in the smut control campaign during a three months furlough which he obtained from Stanford University where he is instructor in mycology and plant pathology, has returned to his teaching duties.

Werner F. Nehrling, of the smut control campaign, was in Washington on January 3 for conference.

A. A. Potter returned to the office on the 15th after a ten days' absence due to an attack of influenza.

Raymond C. Rose has been appointed Assistant Pathologist, effective January 10, to assist in barberry eradication. He is a graduate of the University of Minnesota where he also received the degree of M. S. Mr. Rose has much experience in plant pathology, having served as a plant pathologist at the University of Minnesota, the U. S. Office of Forest Pathology, and at the insular experiment station at Rio Piedras, Porto Rico. He has recently been discharged from the Army.

Elmer Lawrence Sargent has been appointed Assistant Pathologist, effective January 4, to assist in barberry eradication. He is a Colorado Agricultural College graduate and has recently been discharged from an officers' training camp.

Fred M. Wilson has been appointed Assistant Pathologist, effective January 10, for service in the barberry eradication campaign. He is a Michigan Agricultural College man and has been an officer in the Army.

George L. Zundel, Leader of the smut control campaign in the State of Washington, and assistant in the investigation of thrasher explosions and fires, arrived in Washington on January 17, for conference and report writing.

VISITORS

The following State officials have visited the office recently for conference in connection with cooperative relations with this office in cereal investigations.

Jan. 4- F. S. Cooley, Director of Extension, Montana College of Agriculture
" 4- C. A. Mooers, Agronomist, Tennessee Agricultural Experiment Station
" 6- C. G. Woodbury, Director of Purdue Agricultural Experiment Station.
" 11- B. Youngblood, Director of Texas Agricultural Experiment Station.
" 11 - A. B. Conner, Agronomist and Vice-Director of Texas Agricultural Experiment Station.
" 11- J. O. Morgan, Professor of Agronomy, Texas College of Agriculture.
" 11- J. H. Sheppard, Acting in Charge of substations in North Dakota.
" 11- Harry C. J. Umberger, Acting Director of Extension, Kansas College Agriculture.
" 11- A. D. Faville, Dean of Agriculture and Director of the experiment station in Montana.
" 13- J. R. Fain, Professor of Agronomy, Georgia College of Agriculture.
" 13-L. W. Fluharty, Director of Extension, Idaho College of Agriculture.
" 13-E. J. Iddings, Dean of Idaho, College of Agriculture.
" 13-F. D. Farrell, Director of Experiment Stations in Kansas.
" 13-F. B. Linfield, Dean of Agriculture and Director of Experiment Stations in Montana.

PUBLICATIONS

Purdue Experiment Station Bulletin No. 224, entitled "Selection of Disease-Free Seed Corn," by G. N. Hoffer and J. R. Holbert, has just been published. The work reported in this publication is the result of cooperation between the Purdue University Agricultural Experiment Station and this office, and the fac ts embodied therein have in a large measure been developed by investigations carried on by the authors during the past five years. The purpose of the bulletin is to show that poor stands and unprofitable yields, which in the past have been attributed to other causes, often are due to hitherto little-understood disease-producing organisms, and to urge the importance of sowing disease-free seed corn. The selection of seed ears from disease-free stalks is recommended and explained and it is shown how, by a careful study of germinating seedlings, ears carrying disease-producing organisms may be discarded from seed stock. The illustrations are quite exceptional and the entire bulletin well gotten up. It should be exceedingly useful in preparation for the coming crop season.

MONTHLY WEATHER REVIEW: SUPPLEMENT NO.9.

Copies of Supplement No.9 to the Monthly Weather Review are being sent to all those connected with the Office of Cereal Investigations. This

is a reprint of an article entitled "Periodical Events and Natural Law as Guides to Agricultural Research and Practice," by Dr. Andrew Delmar Hopkins, Forest Entomologist, of the Bureau of Entomology. The object of this paper is made clear in the intoductory statement, as follows:

> "The object of this paper is to make available for agricultural research and practice certain information which has been gained from an extended investigation of the principles and laws which govern periodical events in the seasonal history of forest insects and the time for the most effective treatment to control or prevent their depredations. It is intended to show that there is in general a safest and best time for periodical farm and garden practice to guard against or control insect and other enemies and to secure the best returns from the expenditure of money and labor and, by means of maps and calendars and tables of periodical events in the seasonal activities of common plants, to show how the safest and best time for certain kinds of periodical practice can be approximately determined for any place in the country. A further object is to give examples of the application of our present knowledge of a bioclimatic law to research and practice with the hope that these examples, empirical as some of them are, will serve as guides to the further investigations which are required, in various branches of science for all sections of the country, to furnish more exact information for immediate application to practice."

Additional copies of this publication are on hand in this office and will be supplied to any who make request for them.

MOUNTS

There are in stock in the office several hundred Ricker mounts for displaying heads and grain of the different cereals. If any of the field men can use these mounts, kindly inform the office as to the number desired. They must be disposed of promptly as storage space is limited.

PROJECT 211. CEREAL PRODUCTION AND IMPROVEMENT.

Emergency Extension in Cereal Production.

In the Food Production Act, which passed on November 21, 1918, was carried an appropriation for emergency cereal production. In view of the fact that the armistice already had been signed and the emergency presumably had passed, the plans previously made were revised and the scope of the work reduced. The allotments made cover extension work with barley, rice, flax, and grain sorghums.

Stabilizing barley production in 1919. The loss of the brewing and milling market is likely to cause considerable uncertainty as to the market price for the 1919 barley crop. This is especially true in the upper Mississippi Valley and Great Lake sections where the better grades of barley usually have been marketed and not fed. Throughout this area the acreage of barley probably is considerably less than it should be when judged from the quantity of feed produced per acre. It is thought that eventually the acreage in this section will be considerably more than at present. It is entirely possible, however, that the immediate effect of the loss of the cash market will be to decrease the acreage which, from the farm standpoint, would be unfortunate. In this section, on the better drained soils that are not sandy, barley yields more pounds of feed per acre than the other small grains. It can be seeded later than most spring grains and, therefore, fits well into the distribution of farm labor.

An effort will be made during February and March to place such information as is available before the farmers in these States. The increased use of barley as a feed will be encouraged as far as possible and barley will be recommended for favorable consideration by farmers growing small grain for feed.

Emergency Rice Production. The fund provided is to cover stimulation of rice production on non-irrigated land in the southeastern United States and in Porto Rico. The work in Porto Rico was begun last year on a small fund made available at that time. It will be continued during the coming crop season and it is planned that Mr. Chambliss will visit the island again during the summer to continue the stimulation of rice production in cooperation with the Porto Rico experiment station.

The work in the southeastern United States will be conducted in cooperation with the State extension service and experiment stations. Mr. Ross R. Childs, formerly in charge of the cooperative cereal experiments in Georgia and recently released from military service, has been appointed to begin this work in Georgia and commenced his duties on January 11. He will visit farmers located in the coastal districts of Georgia, and probably in adjacent States also, to determine where it is feasible to attempt rice production without irrigation, and to encourage farmers to grow this crop.

Emergency Flax Production. The fund available for extension of flax production will be used both in the upper Mississippi Valley and in the Pacific Southwest.

Mr. C. H. Clark already has left to plan the work in cooperation with officials of the States in these two sections. In the upper Mississippi Valley, work will proceed along the lines of locating choice seed of wilt-resistant varieties and encouraging the sowing of such seed on a fairly large acreage. In the Southwest an endeavor will be made to interest farmer in irrigated districts in growing flax commercially as an early spring crop. The work will be done during the spring months.

Mr. N. C. Donaldson, formerly in charge of cooperative cereal experiments at the Fergus County Substation, Moccasin, Mont., and now under temporary appointment for special work, has been detailed for this service in

Montana. Mr. T. E. Stoa, in charge of flax-rotation experiments in North Dakota, will take up the extension of flax in that State. Mr. A. D. Ellison, recently a lieutenant in the chemical warfare service, but now released from the Army, has been appointed to assist Mr. Clark in the work planned for the Pacific Southwest. It is expected that an additional man will be appointed in Minnesota, another in Wisconsin, and perhaps still others in other States, if circumstances permit.

Emergency Grain-Sorghum Production. The emergency work with these crops will be confined to the southern section of the Great Plains area where it will take the form of locating viable seed of varieties suitable for use in the more elevated and drier sections. Farmers in those sections will be encouraged to substitute these crops more largely for corn. It is planned that men will be appointed for this work in cooperation with State officials in Kansas, Oklahoma, and Texas. While the acreage last year was large, production was diminished by severe drought and a portion of the grain produced is not suitable for use as seed. The lesson continually emphasized by recurring droughts is the superiority of the grain sorghums as farm crops under such conditions.

PROJECT 218. CEREAL DISEASE INVESTIGATIONS.

218A- FUNGI IMPERFECTI AND SAC FUNGI
(Dr. A. G. Johnson, Pathologist in Charge.)

The Nematode or Eelworm Disease of Wheat.

A serious infestation of wheat in Virginia by nematodes was discovered in 1918 by Mr. L. P. Byars, nematode specialist of the Office of Cotton and Forage-Crop Disease Investigations. A survey of the Gulf and South Atlantic States to determine the prevalence of the eelworm or nematode disease of wheat has been conducted during the past season by the Plant Disease Survey and the Field Assistants of Cereal Investigations who have been engaged in the cereal smut control campaign. During the season of 1918 this disease was ~~xxxxxxxx~~ particularly destructive in certain sections of Virginia. It has been found in 23 counties in Virginia, 2 counties in West Virginia, and 2 in Maryland. A careful survey of the entire State of Georgia was conducted by Mr. James Godkin, but with negative results except in one community of Jackson County, in northern Georgia. It was previously found in California also, but to a very limited extent.

A brief summary of this disease is given in Department Circular No.114, entitled "A Serious Eelworm or Nematode Disease of Wheat," by L. P. Byars. The edition of this is at present almost exhausted. The paper is being revised by Mr. Byars and will be published in simplified form as a farmers' bulletin. Mr. Byars also has in preparation an extended scientific article on the same subject. Further investigation is being conducted in which the Office of Cereal Investigations is cooperating.

The more important control measures for this disease involve the use of clean seed or clean land. Usually clean seed can be procured. When uninfected seed cannot be procured, the nematode galls can be effectively removed from infested seed by floating them out in a 20 per cent salt solution by the same procedure as is used to remove ergot sclerotia from thrashed rye. This method is described in Wisconsin Extension Circular No.94. It is important in wheat-growing sections to be on the lookout for this nematode disease so that it may be stamped out at once where found.

218B- INVESTIGATION OF CEREAL RUSTS.

Kansas Wheats Withstand Stem Rust.
(L. E. Melchers)

The past season three varieties of wheat, Kanred (P762), C.I.5146, (P1066) C.I.5879, and (P1068) C.I.5880, all hard red winter wheats of commercial value, have been tried in various States to determine their behavior toward rusts. These varieties have been found to be remarkably resistant to Puccinia graminis tritici, the ordinary stem rust of wheat, under Kansas conditions, and were reported as such in a recent publication by L. E. Melchers and J. H. Parker (Phytopathology 8:79, Feb. 1918). Selections of these varieties from the rust nursery were sown in about fifteen different States in the fall of 1917. They winterkilled in a number of these States, but in New York (Ithaca), Tennessee (Knoxville), Indiana (LaFayette), and Iowa (Ames), the varieties showed much promise of rust-resistance. These varieties were included in the nurseries of several additional States in the fall of 1918. The States cooperating are sowing nursery rows of these varieties, selecting, as far as possible, the location most favorable for exposure to rust. These trials will throw light on the behavior of these wheats under widely different environmental conditions and further the study of their behavior toward biological forms of rust.

Recent Work on the Barberry Eradication Campaign.
(Mr. E. C. Stakman, Pathologist in Charge)

The unusually mild weather of the winter has made it possible to scout profitably for barberry in several States. The scouts worked as far north as Minnesota and North Dakota almost until January 1, when they were transferred farther south.

The most intensive work is being done in Michigan, where a squad of about eight men is working. Progress is indicated by the fact that these men recently finished Grand Rapids, where they found over 2,000 bushes and destroyed all of them, except those in seven locations, before they left town.

Two men have also been working in Indiana.

Five men have been working in Nebraska, and 30,000 bushes were located in the city of Omaha, according to reports of Dr. Wilcox and Mr. Faris.

Two Federal men and three State men have been re-scouting in Iowa and have located a great many bushes. However, they also reported several towns as being entirely free from barberry, showing the effectiveness of the campaign last summer.

It seems quite likely that it will be profitable to scout in Colorado practically all winter and two men will be sent there soon to work there with Mr. Sargent, who has just been appointed assistant State leader in Colorado.

The educational work has been going on without interruption. Barberry demonstrations were put on at the Tri-State Grain Growers Convention, at Fargo, N.Dak., January 14 to 17, and attracted a great deal of attention. At least 2,500 people saw the demonstration

A similar demonstration was made before the Northern Minnesota Development Association and the Minnesota Potato Growers Association and the same will be done at the meeting of the South Dakota Horticultural Society.

The preliminary organization for the summer campaign is now being formed for the several States and the campaign will be renewed with increased vigor as soon as weather conditions permit.

218D- INVESTIGATION OF CEREAL SMUTS.
Summary of Results in the Smut Control Campaign from September, 1917, to December, 1918.

The campaign for the prevention of cereal smuts conducted in 43 States, begun in September, 1917, has brought out the following facts and has accomplished the following results:

(1) Twenty-five per cent more farmers treated seed in 1917-18 seeding season than in 1916-17. (Based on survey and on increased demand for formaldehyde and copper sulphate in rural communities.)

(2) Assuming that the smut campaign has resulted in a 25 per cent increase in acreage sown to treated seed (a fairly conservative estimate), the saving in wheat will amount to 5,000,000 bushels; oats 27,000,000 bushels, and barley 1,000,000 bushels.

(3) Estimated national loss due to wheat smuts in 1918 crop: 25,500,000 bushels.

(4) Estimated national loss due to oat smuts in 1918 crop: 110,000,000 bushels.

(5) Estimated national loss due to barley smuts in 1918 crop: 6,000,000 bushels.

(6) Minnesota and Nebraska together lost this year over 8,000,000 bushels of wheat from stinking smut alone. Practically all of this could have been prevented.

(7) Number of farmers personally advised on their farms regarding smuts and smut prevention: 21,500.

(8) Number of farmers and others receiving instruction through seed-treatment demonstrations and personal instruction average 2,630 per [illegible] States, or a total of 113,090

Results of a field survey to determine the prevalence of seed treatment by farmers and its effects in prevention of smuts.

State	No. of farmers interviewed personally	No. of fields inspected: Wheat	Oats	Inspected fields sown to treated seed: Wheat Per ct.	Oats Per ct.	Smut found in Treated fields: Wheat Per ct.	Oats Per ct.	Untreated fields: Wheat Per ct.	Oats Per ct.
Alabama	668	237	500	10.5	3.2	0.0	1.73	3.20	5.95
Arkansas	184	132	78	0.45	0.0	0.0	0.0	2.35	7.35
Georgia	225	136	141	38.9	22.6	0.05	0.10	4.47	10.65
Illinois	111	54	59	0.0	18.6	0.00	1.21	6.65	7.38
Indiana	477	159	390	57.1	39.0	3.03	0.35	6.06	5.92
Iowa	536	195	214	4.10	6.5	0.030	0.053	1.36	1.37
Kansas	334	187	147	0.05	0.01	0.000	0.000	0.81	4.49
Michigan	98	18	31	66.66	70.96	0.031	0.018	10.16	6.52
Minnesota	678	688	540	16.2	18.6	0.87	1.23	3.99	3.07
Mississippi	328	174	218	8.6	6.8	0.73	0.72	2.72	5.69
Missouri	1,176	845	515	5.9	2.5	0.63	2.90	2.33	4.97
Nebraska	350	242	110	6.6	1.6	1.12	0.70	8.11	6.45
New York	793	887	571	6.2	25.4	0.00	0.71	0.23	4.30
North Carolina	364	262	108	38.0	4.34	0.086	0.00	1.49	11.11
North Dakota	300	155	67	71.61	50.74	0.254	0.67	5.61	11.83
Ohio	211	224	55	1.7	10.9	0.25	0.125	0.80	10.42
Oklahoma	360	184	180	0.0	0.0	0.00	0.000	0.56	6.15
Pennsylvania	544	414	78	0.0	17.0	0.00	0.166	0.171	4.50
South Carolina	156	79	67	50.6	10.4	0.00	3.1	0.43	7.76
Texas	416	186	207	2.0	0.6	0.00	0.25	0.08	4.26

The figures for the twenty States named are representative of the forty-three States in which seed-treatment demonstrations and smut surveys were carried on.

Continuation of work. The magnitude of the losses caused by preventable cereal diseases has been noted above. Without doubt a continuing campaign to control or eradicate cereal smuts is fully justified on the basis of crop saving. In the present state of public sentiment, observation and experience have shown that seed-treatment campaigns must be continued or only the most progressive farmers will continue to treat their seed. The majority are not yet awakened to the losses sustained and the increased profit resulting from the inexpensive treatment. If the campaigns were continued for a few years it is probable that the practice would become fairly universal and losses reduced to a comparatively negligible minimum.

This emergency demonstration of smut control has shown clearly the urgent need of investigation of several factors in smut infection and smut control. Among these questions requiring investigation are:

(1) Causes of seed injury during treatment and the finding of equally effective but less harmful chemicals for use in treating seed. Some progress already has been made in solving this problem.
(2) The physiology of germination after treatment.
(3) The distribution of the two species of bunt or stinking smut and their reaction to treatment.
(4) Means of distribution of smut spores.
(5) The means and extent of soil infestation and its relation to subsequent crop infection.

9
917

FEB 24 1919
BUREAU OF INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

*****

Vol. 11 January 31, 1919 No. 2
Miscellaneous Issue

*****

PERSONNEL (AGRONOMIC PROJECTS)

Charles E. Chambliss suffered from an attack of influenza this month which kept him at home for about ten days.

N. C. Donaldson, who has been engaged on special detail to write the annual report on cooperative cereal investigations at the Belle Fourche Experiment Farm, Newell, S.Dak., during the winter, completed this work on January 20 but was immediately assigned to the flax extension campaign in Montana and is working under the direction of the State extension leaders to increase flax acreage and locate stocks of resistant seed.

Arthur D. Ellison, who has been connected with this office for several years as Superintendent of the Nephi Substation and later in charge of the cereal experiments at Arlington Farm, has been discharged from military service and we have obtained his reappointment as Scientific Assistant. At present he is assisting Mr. C. H. Clark in stimulating flax acreage in the Pacific Southwest.

Obie Shattuck has been appointed Agent, effective February 1, to succeed Mr. John H. Martin as Superintendent of the Harney Branch Experiment Station, Burns, Oreg. Mr. Shattuck is a graduate of Oregon Agricultural College where he received the degrees of B.S. and M.S.

Mrs. Eleanor G. West and Beulah A. Simpson, stenographers at this office, resigned December 15 and 31, respectively.

PERSONNEL (PATHOLOGIC PROJECTS)

REGULAR PROJECTS

Charles W. Hungerford, Pathologist in charge of the Black and Stripe Rust project, who has been at the office since January 6, left Washington on the 21st to return to his permanent station at Corvallis, Oreg., stopping at University Farm, St. Paul, Minn., to confer with Dr. Stakman and other workers on the project.

Charles Raymond Hursh, who has been assisting in the barberry eradication campaign, has been assigned to the Black and Stripe Rust project at Berkeley, Calif. He reported at Chicago to Mr. Hungerford who was en route from Washington to Corvallis, and stopped at St. Paul, Minn., for conference with Dr. Stakman and others.

Mrs. Mary L. Lansdale was appointed on January 23 as temporary typewriter operator and has been assigned to Dr. Humphrey's office.

Ruth L. Lewis, Stenographer and Typist, has been transferred to this office from the Navy Department where she has been engaged in war work. She is assisting Dr. Reed.

W. W. Mackie, formerly in charge of the smut control campaign in California, has been placed in charge of the Black and Stripe Rust project at Berkeley, Calif. Mr. Mackie has been in Washington since January 15 and left for Berkeley on the 30th.

Benjamin F. Wood has been appointed Assistant Pathologist, effective January 25, to assist in the corn root and ear rot investigations at Bloomington, Ill. He is a graduate of the University of Wisconsin and has recently received his discharge from the Army.

EMERGENCY PROJECTS

The Barberry Eradication Campaign

Raymond E. Arp has been appointed Assistant Pathologist, effective January 14, to assist in barberry eradication. He is a University of Minnesota man, and during the summer of 1917 assisted in the White Pine Blister Rust Survey. He has recently been discharged from military service.

Lytton Calrow, who was appointed on January 10 as Assistant Pathologist to assist in the barberry eradication campaign, declined the appointment as he had accepted employment elsewhere.

Bret E. Cooley, Glenn M. DeGroft, M. A. Nichols, and A. E. Faller, who have been assisting in the barberry eradication campaign on a part-time basis, have resigned on the expiration of their temporary appointments.

Frank J. Dietsch has been appointed Assistant Pathologist, effective January 14, and will be assistant State leader of the barberry eradication campaign in Montana. Mr. Dietsch is a graduate of Oregon Agricultural College, from which he received the degrees of B.S. and M.S.

G. D. George spent a few days in New York City this month for the purpose of visiting moving picture laboratories in connection with the production of his animated cartoon illustrating the story of the "barbarous barberry" and the black rust of wheat and other grains.

Edward D. Longnecker has received appointment as Assistant Pathologist, effective January 18, to assist in barberry eradication in Michigan and adjoining States. He has recently been discharged from the 84th Field Artillery, Camp Sheridan, Ala., where he was serving as 2nd lieutenant. He is a graduate of Michigan Agricultural College.

Andrew G. Weideman has been appointed Assistant Pathologist, effective January 14, to assist in the barberry eradication campaign in Michigan. He received his education at Faris Institute and Michigan Agricultural College.

Freeman Weiss was appointed Assistant Pathologist on January 24 and will be assistant State leader in the barberry campaign in Minnesota. He is a graduate of Minnesota College of Agriculture, has taken post-graduate courses at Minnesota and Cornell and was instructor in botany at Cornell. He has recently been released from the Army.

Joseph J. Wilson, who took part in the smut and barberry eradication campaigns last spring, has been discharged from military service, and we have obtained his reappointment as Assistant Pathologist, effective January 13. He will assist in the barberry campaign in Iowa and adjoining States.

Smut Control Campaign

Newton C. Brackett, who resigned from the smut control campaign last spring to enter the Army, has received his discharge from military service and has been reappointed as Assistant Pathologist to assist in the smut control campaign. He will begin work in Georgia.

R. A. Carroll, H. K. Vance, and Wilmer W. Wood, who have been assisting in barberry eradication since the completion of last season's smut control campaign, have been reassigned to the smut control campaign and are at present working in Texas.

Dr. A. T. Evans, who has spent the winter at the office compiling the results of last year's campaign, left last week for Texas and Oklahoma to stimulate seed treatment in connection with the smut control campaign. After completing the work there he will go to Bloomington, Ill., to assist in the corn root and ear rot investigations.

R. A. Langenbacher has been transferred from the barberry eradication campaign to the smut control campaign. At present he is working in the Central West district.

Russell R. Mellett, who assisted in the smut control campaign last spring, has been released from military service and we have obtained his reappointment as Assistant Pathologist, effective January 21, for service in the smut control campaign.

Werner F. Nehrling has been in Washington since January 20 assisting with the work of the office in connection with the smut control campaign, will leave on January 5 to begin the smut control work of this season in South Dakota.

Joseph V. Quigley has been appointed Assistant Pathologist, effective January 28, and will assist in the smut control campaign in Kansas. He has recently been discharged from the Army.

Charles S. Reddy was at Washington, Va., on January 30 and 31 for the purpose of inspecting wheat fields which had been attacked by a disease unfamiliar to the farmers of the community, who were afraid the entire crop had been destroyed and requested the office to advise them as to whether or not they should allow the wheat to stand. The disease proved to be powdery mildew which the unusually mild weather had permitted to develop to an unusual degree. The plants seemed to be surviving, however, and Mr. Reddy was confident that a crop would result with the continuance of favorable weather. Mr. Reddy said he never had seen such a severe occurrence of this fungus in the field. It is more common to the greenhouse.

CIVIL SERVICE EXAMINATION

The Civil Service Commission will hold the regular semi-annual spring examination for Scientific Assistants during the first week in April. The scheduled examinations of interest to present or prospective workers in this office are those concerned with agronomy, plant breeding, and plant pathology. Other closely related subjects are forage crops, grain standardization, and plant physiology.

MEMORANDUM ON PUCCINIA GLUMARUM

The following memorandum has been issued under date of January 28 to the pathological inspectors of the Federal Horticultural Board by R. Kent Beattie, Chief Pathological Inspector:

"1. Wheat from east of the 104th meridian is to be considered as coming from a Puccinia glumarum free region, and is to be passed as far as this disease is concerned unless visible evidence of its presence is found.

2. Wheat from west of the 104th meridian is to be considered as coming from a region where Puccinia glumarum exists. It will only be passed when it is more than two years old. That is, in 1919 wheat of the 1916 or any earlier crop will be passed.

3. The eastern United States and foreign countries are to be treated alike in being protected against this disease.

4. These instructions will be subject to modification if the Office of Cereal Investigations furnishes evidence to us that there are regions west of the 104th meridian free from this disease or that the disease is not transmitted on the seed."

1.9
6917

FEB 20 1919

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

*****

Vol. 11 February 10, 1919 No. 3
Field Station Issue
*****

PERSONNEL (AGRONOMIC PROJECTS)

L. C. Aicher, Superintendent of the Aberdeen Substation, Aberdeen, Idaho, arrived in Washington on February 8 for conference and the writing of a bulletin and his annual report.

Norman A. Gray was appointed messenger, effective February 4.

Mary L. Middleton, who came here in September as Clerk, has returned to her home in Louisiana where she has accepted a position with the Board of Education of Shreveport, La. Miss Middleton was a teacher before coming here.

PERSONNEL (PATHOLOGIC PROJECTS)

Fred N. Briggs has been appointed Assistant Pathologist, effective February 4, to assist in the smut control campaign in Nebraska and Montana. He is a graduate of the University of Missouri.

Frank Frolik has been appointed Assistant Pathologist, effective January 28, and will assist in the smut control campaign in Minnesota and adjoining States. Mr. Frolik served in the barberry campaign last spring, resigning in May to enter military service.

Merle C. Gillis, Field Assistant in investigations of Fusarium rots of corn, resigned on January 31 on the expiration of his temporary appointment.

David Q. Grove, Field Assistant in corn rot investigations, resigned January 28 to take up work with the Davey Institute of Tree Surgery, Kent, Ohio, where he was employed before entering the service of the Government.

Harvey B. Harris has been appointed Assistant Pathologist, effective February 8, to assist in the barberry eradication campaign in Nebraska and adjoining States. Mr. Harris was formerly Superintendent of Schools at Cook, Nebr., and recently has been discharged from the Army. He received his education at Peru, Nebr., State Normal School, Cornell University, and Nebraska State University, and has specialized in botany.

R. J. Hosmer, who resigned last spring from the barberry eradication campaign to enter the Army, has received his discharge and has been appointed as Assistant Pathologist to assist in barberry eradication.

John H. Parker, in charge of Crop Improvement at Kansas State Agricultural College, who has been on furlough for the purpose of compiling the results of his work while connected with this office in breeding for rust resistance in wheat and oats, has resumed his work at the college.

R. H. Porter has been appointed Assistant Pathologist, effective January 8, to assist in the smut control campaign in Iowa. Mr. Porter was engaged in this work for a short time last spring before he entered the Army. He is a graduate of Iowa State College.

C. S. Reddy left Washington at the beginning of February for North Carolina and Georgia to study the Seed Treatment - Seed Injury experiments at the State experiment stations. He will also visit the State experiment stations at Knoxville, Tenn., and Lexington, Ky., and make arrangements for spring work in smut control.

Dr. E. C. Stakman is in Washington at present for conference and completion of his bulletin on barberry and black stem rust.

W. G. Stover, of the Department of Botany at Ohio College of Agriculture, who was leader of the smut control campaign in Ohio last year, is again in charge of this work.

George L. Zundel, leader of the smut control campaign in Washington, who has been at the office for several weeks, left on February 4 for Pullman, Wash.

PUBLICATIONS

First page proof of a paper for the 1918 Year Book, entitled "The Place of Rye in American Agriculture," by Dr. C. E. Leighty, was read on January 30.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins)

Rice thrashing was completed on January 10 and soy beans on the 31st. Rice is in very good condition. The principal loss was due to rats and mice. Soy beans that were not damaged before being put into the stack are in very good condition.

Bad weather has prevented fall plowing and the seeding of fall grain.

Some farmers have not completed rice thrashing. Much of this delay is due to the large number of farmers that are dependent on one thrashing outfit.

The total precipitation for the year 1918 was 61.86 inches. During the period from September 1 to December 31, inclusive, the precipitation was 25.23 inches. For the year 1917 the total was 38.06 inches, and for the period from September 1 to December 31, inclusive, in that year, 5.60 inches.

On January 25 to 27, Mr. Ryozo Fujii, Director of Moroto Sholuson Gomei Kaisha, Kuwana, Japan, visited the station. He was especially interested in irrigation engineering.

GEORGIA

State Experiment Station (Athens) and Substations (Prof. Loy E. Rast)

A cold spell here on January 4, when the thermometer is reported to have gone to 10 degrees above zero, severely damaged our oat crop. Some of the latest seedings, I think, are killed outright, while some of the older and more vigorous strains and varieties of other sowings probably will survive. This freeze has apparently damaged all of the small grain, as the wheat and even the rye plants are discolored, though I think these crops are only slightly damaged and I doubt if the stand is impaired.

On one of our ranges where a fertilizer experiment is being conducted, the plats receiving acid phosphate are only slightly damaged, while those receiving no commercial fertilizer or potash, nitrogen, or combination of these two without acid phosphate, are apparently dead.

VIRGINIA

Arlington Farm, Rosslyn (H. P. Ames)

Clear, cold weather has prevailed during January. Precipitation for the month was 3.83 inches; maximum temperature 61°, on January 21, minimum 10°, on January 5.

In general the winter grains on the farm are in good condition. The less hardy varieties of winter oats and barley apparently have escaped serious injury from cold. In a great many varieties the upper leaves of the plants have been frozen badly. Otherwise the plants are in a healthy condition. Heaving of soil has not occurred to any great extent.

Winter wheat in the surrounding country generally is in good condition, although some fields show the effects of insufficient moisture during November and December.

NEW YORK

Cornell Experiment Station, Ithaca (Dr. H. H. Love)

January 4. During the first part of December a large number of F_1 seeds of new wheat hybrids were sown in the greenhouse. This series included a great many species crosses as well as a number planned for practical purposes, including winterhardiness, rust-resistance, and so forth. These included over 150 different combinations.

The weighing of the oats to determine yields for the series tested last year has been completed and some new hybrid combinations and new selections are showing much promise. It is interesting to note that one or two hybrids in which the wild oat serves as one of the parents are showing up very well, so far as yield is concerned. During the month the manuscript on the synthetic production of wild wheat has been completed and is being sent forward for publication. Another manuscript entitled "Fertile Wheat-Rye Hybrids" is also being completed.

Mr. Ernest Dorsey, who has been in the Army in connection with the gas defense work, has been discharged and returns to the department to continue his graduate work. Mr. Dorsey was working on some of the cytological aspects of wheat-rye hybrids and the synthetic wild wheat.

GREAT PLAINS AREA

WYOMING

Cheyenne Experiment Farm (A. L. Nelson)

The first week of January was very cold, the thermometer registering a temperature of 12° below zero. There was scarcely any snow on the ground. The fallow land was bare, the winter wheat showed the effects of the cold weather, and the soil was badly cracked by the frost. There were a few spots of snow left on the grain sown on oat stubble. Other than in these protected spots the grain sown on oat stubble did not seem to survive the cold any better than that sown on fallow land. The winter wheat which was sown August 15 and October 1 seemed least affected. Under the mat of surface leaves the plants were unhurt. The grain which was just up when winter set in could hardly be seen, in fact a great deal looked as though it was killed.

During the latter half of January very fine weather prevailed, the minimum temperatures ranging between 12 and 21°, with quite warm days, the temperature reaching as high as 54°. While the top layer of the soil thawed to a depth of from 2 to 3 inches, there was no heaving of the soil, the top surface being sufficiently dry to prevent this. During this period, the winter wheat sown during the fore part of November sprouted, and that sown October 15 greatly improved in appearance. There were a few windy days during the latter art of the month which caused considerable blowing of the soil on fallow and corn stubble land where the rows run east and west, but where the rows run ~~xxxx~~ north and south the blowing of the soil could not be noticed. The land sown to winter wheat did not blow much. This is especially true of grain sown August 15, September 1, and November 5. In the first two instances there is a sufficient mat of leaves to prevent soil blowing and in the latter instance the ground was quite wet when the grain was sown, which accounts for its resistance to the wind. However, none of the fallow land sown to winter wheat blew as badly as the fallow which was not sown.

There is considerable leaf rust in the early sowings of winter wheat.

The first two weeks of the month were spent in recording agronomic notes on winter wheats and working on the nursery grains. There are some excellent samples of nursery winter wheats with good yields of grain.

During the last half of the month the nursery work was completed and work on the detailed report is in progress. Discarded machinery has been taken to pieces and the damaged wheel of the windmill has been taken apart and straightened.

NORTH DAKOTA

Dickinson Substation, Dickinson (Ralph W. Smith)

The weather during the month of January has been extremely mild and dry. There was only a trace of snowfall recorded for two days. The snow was about 4 inches deep at the beginning of the month. This began to melt about the first week and was gone by the middle of the month. Since then the ground has been bare.

The mean temperature for the month was approximately 28.1° as compared with a normal mean of 10.6°. The highest mean previously recorded for the month was 22.1° in 1908 and also in 1914. The maximum temperature for the month was 59°, on January 23, and the minimum 31°, on January 2.

Present indications point to an early spring, although there is ample time for some real winter weather yet. During the warmer days Brome grass and alfalfa in sheltered spots started to grow. One farmer plowed his garden and another is reported to have sowed some wheat. A few young grasshoppers were found recently hatched out. This was verified by their being shown still alive to the County Agent.

On November 13 a small amount of N.Dak. No.959 rye was drilled on corn land, the stalks being removed. This did not germinate that month as the highest temperature after the 15th was 45°. It was not examined during December, but on January 30 many of the seeds had sprouts nearly 1/8 of an inch long. These germinated either the first week of December, when the temperature was above 50° for four days with a maximum of 56°, or else during the last ten days of January when the temperature was again above 50° for four days with a maximum of 59°.

In a date-of-seeding experiment with the same variety, rye sown October 16 has sprouts from 1 to 2 inches long. That sown November 1 has sprouts from 1/4 to 1/2 inch long. Both of these germinated early in November. A small increase plat of Beloglina winter wheat sown in sunflower stubble October 1 is apparently about all alive with sprouts about 1/4 to 1.2 inch long that started to grow early in November, the soil being too dry in October for germination. N. Dak. No.959 rye sown at the same time in the same sunflower stubble has sprouts from 1 to 2 inches long.

WESTERN BASIN AND COAST AREAS

IDAHO

Aberdeen Substation, Aberdeen (L. C. Aicher)

The weather over the entire southern Idaho area has been exceptionally dry this fall and winter. Records obtained from the forest rangers by the Weather Bureau indicated that up to about February 1 there was less snow in the mountains than had been recorded for many years, and as a result the irrigation farmers are fearing that the water supply for the coming year

will not be adequate. Warm weather prevailed up until the last two weeks in December. On December 30, however, the temperature reached 11° below zero for the one day. Since then, however, a gradual warming up has taken place and in some instances leveling and shallow plowing was done from the middle to the latter part of January.

The leveling of the dry farm, which is now being put under irrigation, is progressing fairly well and it is hoped to have the entire farm under irrigation and in crop this year.

There is a great demand for Dicklow seed wheat and Trebi seed barley all over southern Idaho. Tons of both of these varieties have been shipped out of the Aberdeen section to various parts of the State and many requests for Dicklow seed wheat, some for carload lots, could not be met because of shortage of supply.

From the recent census taken by the Bingham County Agricultural Agent, the Aberdeen section produced the highest yield of wheat per acre and the greatest tonnage of beets per acre in the county.

OREGON

Sherman County Branch Station, Moro (D. E. Stephens)

There has been no extremely cold weather this winter. There was an unusually long cold spell lasting from the middle of December until the middle of January, but the coldest temperature reached was 5° above zero. The maximum temperatures, however, were below 32° for practically the entire period. During this cold weather there was a thin snow covering which afforded some protection to grains. Since the middle of January the weather has been mild, and the ground is now about dry enough to plow.

There has been no winterkilling of any of the winter wheats in the varietal experiments. Some spring wheats sown in the nursery have suffered injury. This is especially true of those sown early in the fall which had made a growth of 5 or 6 inches. Little Club, a spring wheat that is fairly hardy, was completely winterkilled in the earliest sown rows, while the rows which had barely emerged before the cold weather show very little winterkilling.

Following are the yields, in pounds per acre, of the leading crops grown on the station in 1918. These yields are of the highest yielding varieties in the varietal experiments and the crops were all grown after a summer fallow:

	Seed yield, lbs. per acre
Red Winter spelt	2270
Walla Walla White Dent corn	1944
Turkey local wheat	1638
Brown Winter emmer	1630
Mariout spring barley	1392
Sixty Day oats	1290
Hard Federation spring wheat	1278
O'Rourke field peas	1098
Vern spring rye	812
Giant Winter rye	680
Early Ohio potatoes	9438

CALIFORNIA

Plant Introduction Garden, Chico (Victor H. Florell)

December 16. Practically all nursery grains have emerged. The percentage of germination is high and stands are uniform.

Stands of the grains in the field plats are generally good with the exception of Farly Baart and Prohibition wheats. These varieties were resown on December 14. The low germination may be attributed in part to the presence of a small maggot-like worm which attacked the germinating seed, but the use of badly smutted seed was perhaps also responsible. The maggots or larvae apparently were present in quite large numbers. Specimens of these have been forwarded to the Bureau of Entomology for identification by Mr. Sanford of that Bureau.

1.9
P6917

LIBRARY
MAR 10 1919
BUREAU OF PLANT INDUSTRY

CEREALL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S.Dept. of Agriculture.
(NOT FOR PUBLICATION)

****

Vol. 11 February 28, 1919 No. 4
Project and
Miscellaneous Issue

****

PERSONNEL (ADMINISTRATIVE PROJECT)

Flora F. Justin was appointed stenographer on February 1, and is assisting Mr. C. H. Clark and Mr. Rothgeb.

William F. McCoy has been appointed clerk, effective February 19.

Virginia P. Smith has been appointed bookkeeper, effective February 11.

Ella Stevens has been appointed clerk. She comes from the Food Survey Division of the Bureau of Markets, having completed the work in which she was engaged there.

PERSONNEL (AGRONOMIC PROJECTS)

Thomas H. Campion has been appointed Field Assistant, effective February 8, to assist in stabilizing barley acreage in the State of Wisconsin. Mr. Campion was superintendent of the agricultural school in La Crosse County, Wisc., for several years, and during the past year has been employed by the States Relations Service as emergency demonstration agent in La Crosse County.

Arthur E. Enerson has been appointed Field Assistant, effective February 8, to assist in stabilizing barley acreage in Minnesota. Mr. Enerson is a graduate of Minnesota Agricultural College. He has just received his discharge from the Army in which he served as 2nd lieutenant in infantry. Before entering the Army he was County Agent at Great Falls, Mont.

Edwin S. Landry, who resigned last summer from the Crowley Rice Station, Crowley, La., to enter the Army, has received his discharge and has returned to Crowley where he has been reappointed as Field Assistant, effective March 1.

John H. Martin, who has been appointed Scientific Assistant in Western Wheat Investigations, arrived in Washington on February 15.

PERSONNEL (PATHOLOGIC PROJECTS)

Donald Bain has been appointed Field Assistant, effective February 22, to assist in the barberry eradication campaign. Mr. Bain was a student at the University of Tennessee before entering the Army, from which he has just received his discharge.

E. F. Blaine left Washington on February 23 for Ellenboro, W.Va., to inspect wheat fields in which the presence of the Nematode disease of wheat was suspected. He will then visit points in Virginia for the same purpose.

Sarkis Boshnakian, who has recently been discharged from military service at the Army Medical Museum , has been appointed Assistant Pathologist, effective February 5, to assist in the barberry eradication campaign. Mr. Boshnakian was connected with this office during the summer of 1917 when he assisted in cereal breeding at Arlington Farm and afterwards in barley investigations at the University Farm, St. Paul.

Newton C. Brackett, who served in the smut control campaign last spring before entering the Army, has received his discharge and has been reappointed as Assistant Pathologist in the smut control campaign.

Ralph E. Curtiss has been appointed Assistant Pathologist, effective February 20, to assist in the barberry eradication campaign. He is a graduate of Illinois College of Agriculture.

Leland L. DeFlon has been appointed Assistant Pathologist, effective February 15, to assist in barberry eradication. He is a graduate of the College of Forestry of the University of Minnesota and has recently been released from military service.

Charles Drechsler, who resigned from the barberry campaign last summer to enter the Army, has been reappointed Assistant Pathologist, effective February 15, for barberry eradication.

G. D. George left for St. Paul on February 26. He is still engaged on the production of the animated cartoon telling the story of black stem rust and the barberry.

Marion A. Harrison has been appointed Assistant Pathologist, effective February 12, to assist in the barberry eradication campaign. He is a graduate of Oregon Agricultural College and has recently been released from military service.

Ira C. Hoffman has been appointed Assistant Pathologist, effective February 14, to assist in the investigation of the Fusarium rots of corn, at LaFayette, Ind. He is a graduate of Purdue University, where he received the degrees of B.S.A. and M.S.A., and was Assistant Professor of Horticulture at the College of Agriculture, LaFayette, Ind., before entering the Army, from which he has recently been discharged.

Esther Harms has been appointed stenographer to assist at the Agricultural Experiment Station, Lincoln, Nebr., in connection with the barberry eradication campaign.

Dr. H. B. Humphrey left Washington on February 26 for Birmingham, Ala., where he will attend the meeting of the Southern Section of the American Phyto-Pathological Society which met at the Tutwiler Hotel, Birmingham, Ala., on February 26, 27, and 28. He will then visit Lexington, Ky., LaFayette, Ind., Madison, Wisc., St. Paul, Minn., Manhattan, Kans., Bloomington, Ill., and Ames, Iowa, to confer with those in charge of the various cereal disease investigations. He will return to Washington about March 15.

M. B. Kroft, who assisted in the barberry eradication campaign last spring, has been discharged from the Army and we have obtained his reappointment as Assistant Pathologist, effective February 17, for barberry eradication.

Emile Mardfin has been appointed Assistant Pathologist to assist in the cooperative leaf-rust investigations at Purdue University. He is a graduate of Cornell University and has studied at the Colleges of Agriculture in Wisconsin and Massachusetts. He has recently received his discharge from the Army.

Walter C. Pfaender has been appointed Assistant Pathologist for the barberry eradication campaign. He is a University of Minnesota man.

Roy H. Quinn has been appointed Assistant Pathologist, effective February 15, to assist in barberry eradication. Mr. Quinn has been recently discharged from military service. He is a graduate of South Dakota Agricultural College and has been an instructor in agriculture in the Minnesota high schools for several years. Before entering the Army he was employed as Junior Land Classifier in the Department of the Interior.

Walter J. Roth, who assisted in the barberry eradication campaign last spring, has received his discharge from the Army Air Service and has been reappointed Assistant Pathologist, effective °February 15, for barberry eradication.

Dr. E. C. Stakman left for St. Paul on February 25. While in Washington he completed the manuscript on Black Stem Rust and the Barberry and discussed the coming barberry eradication campaign.

VISITORS

Dr. Henry C. Taylor, head of the Department of Agricultural Economics at Wisconsin College of Agriculture, was an office visitor on February 26. He is a member of the advisory committee on the reorganization of the Office of Farm Management.

PROJECT CONDITION AND PROGRESS.

218-C. INVESTIGATIONS OF DOWNY MILDEWS OF CORN AND ALLIED CROPS

The following is an extract from a letter dated December 28, 1918, from Dr. Wm. H. Weston, Los Banos, Laguna, P.I., who is in the Orient for the purpose of studying the downy mildews of corn and allied crops:

"Since last I wrote you I have made considerable progress in the work. In the first place, my tests on the susceptibilities of different varieties to the downy mildew of corn has yielded information of importance. Through the kindness of Mr. G. N. Collins, of Crop Acclimatization and Adaptation Investigations, I have been given seed of corn varieties from all over the world, from both tropical and temperate regions. All of these which have been tested so far have proven susceptible to the disease; and since a wide range of varieties, including tunicate (pod), waxy, pop, dent, flint, flour, and sweet corns, have been tested, it seems probable that there is no type of maize markedly resistant to this extremely serious disease."

17

MAR 29 1919

CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

*****

Vol. 11 March 20, 1919 No. 5
Field Station Issue
*****

REPORTS FROM FIELD STATIONS.

With the approach of spring and the increase of activity on field stations, all station men are asked to send promptly and regularly semi-monthly and monthly reports of station activities and of cropping progress and crop conditions in the community, with any other items that appear to be of interest. Your cooperation in this will enable the office to issue the Courier effectively.

PERSONNEL (AGRONOMIC PROJECTS)

Luster R. Brooks has been appointed Field Assistant, effective March 14, to assist in Eastern Wheat investigations. He will be stationed at Arlington Farm. Mr. Brooks is a graduate of Kansas State Agricultural College and has been employed as assistant land classifier in the U. S. Geological Survey.

A. D. Ellison, whose appointment to assist in preliminary extension of flax growing in the Southwest was scheduled recently, has been detailed to take charge of the cooperative cereal experiments on the Bellefourche Experiment Farm, at Newell, S.Dak., and will report there in the near future.

Edgar S. McFadden, formerly representative of this office in charge of cooperative cereal experiments at the Highmore Substation, Highmore, S.Dak., was recently released from military service at Camp Lewis, Wash., and reported for duty at Highmore on March 7.

Arthur E. McClymonds has been appointed Field Assistant, effective March 16, to assist in stimulating grain-sorghum acreage in Kansas. Since his discharge from the Army in December he has been connected with the Extension Division of Kansas State Agricultural College.

J. B. Sieglinger has returned to the Woodward Field Station, Woodward, Okla., after completing his report and assisting in the preparation of a manuscript on Broomcorn Experiments.

C. W. Warburton, Agronomist in charge of Oat Investigations, who is on special detail in charge of the application of the President's Seed Loan fund in the northern district, with headquarters at Great Falls, Mont., is in Washington for conference concerning the reorganization of experimental work in the office and to plan for the work he will do in supervising field experiments during the coming season. He will return to Great Falls, Mont., about April 1 to supervise further work in connection with seed grain loans.

Hugh Webster has been appointed Field Assistant, effective March 8, to assist in stimulating grain-sorghum acreage in Oklahoma. He is a graduate of Iowa State College and George Washington Law School. He was employed from 1913 to 1916 as expert in animal husbandry in the Office of Experiment Stations, after which he practiced law. During the war he has served as 1st lieutenant in field artillery.

PERSONNEL (PATHOLOGIC PROJECTS)

REGULAR PROJECTS

Henry D. Barker has been released from service in the Navy and has been reappointed Agent, effective March 14, to assist in investigations of black and stripe rust in Minnesota.

Carlyle Carr has been appointed Field Assistant, effective March 11, to assist in investigations of the Fusarium rots of corn, at Bloomington, Ill. He is a graduate of the University of Wisconsin and has recently been employed by the U. S. Geological Survey.

S. M. Dietz, who was assisting in the investigation of leaf rusts at Ames, Iowa, before he entered the Army, has returned to Ames under appointment as Assistant Pathologist, effective March 1.

Marion Griffiths, who has been assisting in the smut control campaign in the State of Washington, under temporary appointment, has been appointed Assistant Pathologist, effective February 16, and will come to Washington to assist in laboratory and greenhouse work in connection with investigations of smut and other fungi.

Dr. H. B. Humphrey returned on March 15 from an extended trip through the Central West, during which he visited a number of stations where cooperative cereal disease investigations are at present being carried on. En route he attended the conference of Southern Plant Pathologists at Birmingham, Ala.

Nellie E. Hunt, Field Assistant, who has been assisting Professor Melchers, at Manhattan, Kans., in black and stripe rust investigations, resigned effective February 19, as she is going to be married soon.

Dr. A. G. Johnson left Ames, Iowa, on March 12 for an extended trip in the Pacific Coast and Intermountain States in the interests of the investigation of barley stripe disease and the further investigation of the Rhynchosporium disease of barley. While on the Pacific Coast, Dr. Johnson also will make field observations on the occurrence of other diseases of cereals caused by fungi imperfecti and sac fungi.

Charles O. Johnson has been appointed Assistant Pathologist, effective March 5, to assist in stem rust investigations at Manhattan, Kans. He is a graduate of Kansas State Agricultural College and has been discharged recently from military service.

C. W. Johnson, H. J. Stevens, and A. C. Wilcox have been transferred from the smut control campaign to black and stripe rust investigations at Berkeley, Cal.

Julian G. Leach, Agent, who has been engaged in rust investigations at St. Paul, Minn., resigned March 15 to become Assistant Professor of Botany at the Colorado College of Agriculture.

C. A. Ludwig, who served in the barberry campaign last spring, has recently been released from military service, and has been appointed Assistant Pathologist, effective March 16, to serve in Indiana in connection with investigations of black and stripe rust.

Professor W. W. Mackie, in charge of cooperative rust studies at Berkeley, Cal., will be in Washington to participate in the Federal Quarantine Board hearings scheduled for March 25. The purpose of these hearings is to determine what regulatory or quarantine measures should be taken to prevent the introduction of flag smut and take-all to this country. These two serious grain diseases are now known to exist in Australia.

Oscar D. Sta nton has been appointed Field Assistant, effective March 15, to assist in the investigation of Fusarium rots of corn at Bloomington, Ill. He is a graduate of Denver University and Colorado College of Agriculture, and has been employed in the U. S. Geological Survey.

Dr. W. H. Tisdale, the results of whose successful investigations of the Physoderma disease of corn are just now a ppearing in the Journal of Agricultural Research, and who recently has been Plant Pathologist for the North Carolina College and Station, has been reinstated on the pathologic staff, effective March 20. He will take charge of the investigations of rice diseases, including rotten-neck, straight-head, and others. He arrived in Washington on March 20 to take up his new work.

Ivan A. White has been appointed Field Assistant, effective March 1, on a part time basis, to assist in the rust investigations at Manhattan, Kans. Mr. White is a student at Kansas College of Agriculture. He assisted in the rust investigations at Manhattan last summer before entering the Army.

Clyde M. Woodworth has been appointed Assistant Pathologist, effective March 10, to assist in research at Madison, Wisc., on the control of flax diseases, principally the Fusarium disease known as flax wilt, through breeding for resistance. He arrived in Washington on March 20 for conference. Mr. Woodworth is a graduate of Oklahoma Agricultural and Mechanical College and received the degree of M.S. from the University of Wisconsin. He has just completed the work for a doctorate degree at the University of Wisconsin.

Barberry Eradication Campaign.

Edward G. Amos, who was appointed Assistant Pathologist on December 13, to assist in barberry eradication, declined his appointment as he had obtained other employment.

Robert C. Backstrom has been appointed Field Assistant, effective March 8, to assist in barberry eradication in Wyoming and surrounding States. He has been Superintendent of Public Schools at Thermopolis, Wyo.

William E. Bina has been appointed Field Assistant, effective March 8, to assist in the barberry eradication campaign in North Dakota. Mr. Bina received his education at North Dakota Agricultural College.

Newton C. Brackett and Russell R. Mellett have been transferred from the smut control campaign to barberry eradication.

Frank L. Brunkow has been appointed Field Assistant, effective March 14, to assist in barberry eradication. He served in this capacity last spring before entering the Army.

Dawson H. Burwell has been appointed Field Assistant, effective March 17, to assist in barberry eradication in Colorado and surrounding States. He received his education at Colorado Agricultural College and has recently been discharged from the Army.

W. B. Coffman has been appointed Field Assistant, effective March 15, to assist in rust survey work in Kansas. He is a graduate of Kansas State Agricultural College and has been employed in U. S. Geological Survey.

Warren N. Christopher has been appointed Field Assistant, effective April 1, to assist in the barberry eradication campaign. Mr. Christopher was educated a t the University of Minnesota. He recently received his discharge from the Army in which he served as laboratory technician. He was in the Yale Army Laboratory School and was eligible for a commission when armistice was signed.

Martin S. Hagen has been appointed Field Assistant, effective March 17, to assist in barberry eradication in North Dakota. Mr. Hagen was employed in the North Dakota State barberry campaign during the summer of 1917. He has been field crop inspector for the Department of Botany; Agricultural Experiment Station, Fargo, N.Dak., and has served with the U.S. Office of Forest Pathology.

Marion A. Harrison did not accept his appointment as Assistant Pathologist in the barberry eradication campaign.

William J. Kurtz has been appointed Field Assistant, effective March 25, to assist in barberry eradication in Michigan. He is a graduate of Michigan Agricultural College.

Joseph V. Quigley, Assistant Pathologist in the smut control campaign, resigned March 12. He has accepted a position as County Agent for Kansas State College Extension Department.

Charles R. Stevenson, of Cornell University, has been appointed Collaborator, to assist Mr. V. F. Tapke in the seed treatment campaign for smut control in New York State.

W. W. Wood is now working in Nebraska a nd will be there until about April 16.

FIELD STATION CONDITION AND PROGRESS
February, 1919.
HUMID EASTERN STATES

VIRGINIA

Arlington Farm, Rosslyn (H. P. Ames). The month of February was unseasonably mild, with a maximum temperature of 63°, on the 14th, and a minimum of 16°, on the 11th. Frequent rains, many of which were only showers, gave a total precipitation of 2.11 inches for the month. Of the 2.11 inches, .26 of an inch was in the form of snow on the 21st.

Although the small grains have had no covering of snow this winter they have made normal growth and are in excellent condition. With an abundance of moisture in the soil the crop prospect is very good. Wheat, oat and barley plants being grown in the greenhouse are beginning to head.

NEW YORK

Cornell Experiment Station, Ithaca (Dr. H. H. Love). The second generation of wheat hybrids which were sown in the greenhouse are beginning to head and indicate that we will have much interesting data from these crosses. In one, a cross between the variety Marouani and one of the Clubs, there has developed a new fungus which as yet has not been definitely placed by our pathologists. Some of the plants are badly attacked while, so far, others seem immune. We will keep careful notes on this to see whether it spreads and also to determine whether there is some indication of immunity.

Some notes taken on the cross between a hull-less oat and Avena fatua are showing some very interesting results as regards the inheritance of the hull-less character. The indications are that the results will not be exactly the same as when a cultivated form of Avena sativa is crossed with the hull-less.

The winter has been very mild and indications are that the grain at the nursery has come through the winter very well. However, as we often experience our greatest difficulty during March, it is too early to state just what the conditions will be later. We are now assembling material for the spring seeding which probably will come earlier this year than usual.

Mr. Garber from the Minnesota Experiment Station spent a week with the department studying the results of our oat investigations preparatory to planning the oat breeding work for the Minnesota Station. Mr. A. C. Fraser, who conducted an investigation on the inheritance of awns in oats and who has been in military service, has returned to the department to take up his work again.

Reports are coming in from the farmers, who have received some improved strains of oats, showing in some cases good results and also showing that those who received seed some years back have seed for sale. This year there will be several thousand bushels of the improved pure-line selections offered for sale for New York State. In connection with the seed train, which is to run throughout the State, these oats will be recommended.

GREAT PLAINS AREA

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson). The winter wheat shows the effects of the continual cold windy weather of the first part of the month. That on fallow is in fair condition but that sown in oat stubble looks as though it would be nil. While the winds have been high, there has not been much soil-blowing on land sown to winter wheat. Soil-blowing on fallow land has been considerable.

Work on the annual report is progressing. The outdoor work has consisted in the preparation of plat stakes for the 1919 crop, sorting of potatoes from the general field, repairing of fanning mills, repairing and oiling of harnesses, hauling of manure on general field, and moving hay from stack to barn loft.

NORTH DAKOTA

Dickinson Substation, Dickinson (Ralph W. Smith). For the second time this winter severely cold weather is being experienced. The minimum temperatures have been considerably below zero for the past four days, the minimum point for the winter being reached on the 28th with a temperature of 35° below zero. A minimum of 34° below zero was reached early in January in a cold spell lasting about a week. During the month the weather was rather uniformly mild, although somewhat colder than in January, and there was very little snow on the ground most of the time. The snow is now about three inches deep. During the cold spell early in January the snow was about as deep as at present, giving some protection to winter grains during the severest weather. The soil was very dry at the beginning of the winter and after a winter of very light snowfall an unusual supply of rain will be needed to insure a good crop in this region.

The Stark County Farm Bureau has been organized. A County Agent was secured a year ago, with some opposition from those not familiar with that form of extension work. Now the farmers appear to be quite enthusiastic. The following projects are represented in the executive committee of the Farm Bureau: Live stock, forage crops, grains, home demonstration work, and boys' and girls' clubs. Other projects may be added.

WESTERN BASIN AND COAST AREAS

OREGON

Harney County Dry-Farming Substation, Burns (Obil Shattuck). Snow fell on 21 days during February. The total precipitation for the month was 1.45 inches, .27 of an inch of which fell on the 10th. The maximum temperature was 45°, on the 10th, and the minimum 9° on the 23rd.

Moisture conditions are improving and the farmers are planning to seed rather more than the normal acreage of spring wheat, barley, and alfalfa. It is possible that several wells may be drilled during the coming season to be used for irrigation purposes.

CALIFORNIA

Biggs Rice Field Station (J. W. Jones). February 13. Heavy rains the past few days have been general throughout the Valley. Considerable snow has fallen in the mountains, which will insure our summer water supply for irrigation.

The station at present is submerged with from 4 to 12 inches of flood water, and no doubt a goodly supply of water-grass seed has been carried in from adjoining fields.

BURLAP BAGS.

The Department has recently been offered 60,000 new burlap bags, size 22 x 36 inches, of 10 oz. material, at 14 cents each, f.o.b. New York. Should there be need for such an article on any of the field stations, the station men should promptly notify the office of the quantity desired and at what time they will be needed.

APR 22 1919

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

Vol. II ********** No. 6

April 10, 1919.
Field Station Issue
****

SEMI-MONTHLY AND MONTHLY REPORTS FROM FIELD STATIONS.

With the opening of the new crop season all field station men are asked to resume sending reports from field stations regularly on the fifteenth and last days of each month. The reports sent on the fifteenth will cover the first half of the month; the reports sent on the last day of the month may cover the last half of the month, or may summarize operations for the entire month, as is preferred by the men. In the first case, the two semi-monthly reports will be united here for use in the Courier. In the second case, the final report will be complete in itself and save us that much extra work.

Put into these reports the same kind of news that you would like to read from the other field stations. Then add a little extra to cover differences in tastes. Tell what you have been doing on your station and what the farmers round about have been doing. Give us the latest news on progress of crop growth. Put some human interest into the weather notes. For good measure, or for dessert, add items on farm labor supply, farm machinery, fertilizers, and the other accessories of farming.

I know it takes time and labor to prepare these reports, but the stations are all a long way from us and most of them a long way from each other. We like to know how things are getting along. I believe the station men like to know how their neighbors are getting along. It also takes time and labor to issue the Cereal Courier. We haven't the time or the help to do it as we would like to have it done. Let us try and make it the best we can, appreciating each other's handicaps.

RESEARCH, EXPERIMENTS, AND "TESTS".

There is a growing tendency to use the word "tests" to designate the experiments or investigations being conducted by this Office. In writing annual reports, the men in charge of our investigations at field stations commonly use this word in the headings and sub-headings in the reports, as for instance, - Varietal "Tests", Rate of Seeding "Tests", etc. There seem to be good reasons for not using this word. Here are some of them.

The word "tests" has become associated with the demonstrations given by the extension workers on demonstration farms, or through other channels. In the popular mind the use of this word does not suggest experimental work or investigation of high order. The Office of Cereal Investigations is charged with investigations of cereals, including production and improvement. These investigations include research of a high scientific character, and field experiments which are not of so high a grade. None of these investigations, however, falls below the grade of experimental work.

For several years extension work, including demonstrations and other tests of similar character, has been financed very generously. During the period of war emergency, the funds for extension work have been enlarged to an enormous extent. On the other hand, funds for research and other investigations generally have not been increased in proportion. Increased emphasis on research seems desirable.

The Office of Cereal Investigations must depend on the character and results of its investigations, both experiments and research, for its financial support now and in the future. All members of the staff should keep this fact in mind and work towards this end. The first step is to refer to our work in words that always show clearly its character. Let us forget once and for all the word "test", drop it completely from our vocabulary and use hereafter only the word "experiment" in describing our field operations; the word "research" in describing our highly technical studies, either in field or laboratory; and the word "investigations" when referring to all the operations of the Office. We are not conducting "tests".

FIELD STATION CONDITIONS AND PROGRESS
March 1919.

HUMID EASTERN STATES

VIRGINIA

Arlington Farm, Rosslyn, (H. P. Ames). Considerable variation in the weather conditions prevailed during the month of March, with a maximum temperature of 75° on the 17th, and a minimum of 26° on the 12th. Good rains throughout the month gave a total precipitation of 4.16 inches. Of that quantity, 1.55 inches fell the evening of March 28.

Spring wheat and rye varieties were sown in fortieth-acre plats on March 25. About 100 wheat nursery rows were sown on the 26th. Completion of seeding the cereal smut nursery was prevented by rain on the 27th and 28th.

Prospects for a good crop of winter oats on the farm are better than they have been for several years. Because of the unusually mild winter practically no winterkilling occurred. As a consequence, the less hardy varieties such as Aurora, Fulghum, Red Rustproof, etc., are in excellent condition and give promise of large yields.

NEW YORK

Cornell Experiment Station, Ithaca. (Dr. H. H. Love). The winter wheat nursery came thru the winter very well and it looks as tho we will have a good series for the comparison of the many new hybrids and selections sown last fall. As previously noted, our nursery series include many new hybrids from the series made by Dr. C. E. Leighty. These will be compared with a number from our own laboratory as well as some of the best selections we have been able to make in the State.

During the last week, April 1-5, we have had the most severe weather of the winter. Fortunately, however, there was considerable snow with it and it was of short duration so that the winter grains did not seem to suffer. The weather now is normal for this time of the year and it looks as tho spring seeding will begin possibly next week. We have seed of oats, barley, and spring wheat ready to go into the ground just as soon as the weather permits. The wheat which was sown in the greenhouse in the fall is now heading and a number of new hybrid combinations are being made. The second generation of some very interesting Club-Spelt hybrids also is being grown, and these are just now heading and will afford some further material to study the Mendelian behavior with species crosses.

IOWA

Experiment Station, Ames. (Prof. L. C. Burnett). Spring seeding has been hindered somewhat by unsettled weather. The prospects for winter wheat on the agronomy farm are better than they have been for several years. If weather conditions continue favorable the indications are that many of the plats will make more than 50 bushels per acre.

A sufficient acreage of the new oat, Iowar, is being sown this spring to insure at least another 1000 bushels for distribution in 1920, The demand for it by farmers and experimenters during the current season has greatly exceeded the available supply.

Farm seeding in the surrounding territory is well advanced, although there will be some oats put in throughout the current week.

GREAT PLAINS AREA
(South to North)

KANSAS

Hays Branch Station. Owing to the sudden death of his brother, Mr. F. A. Kiene, Jr., representative of this Office at Hays Branch Station since 1912, has resigned to take up the management of the home farm near Topeka, Kansas. He left Hays on April 3 for his new work and his address is now Valencia, Kansas.

Mr. Arthur F. Swanson, at present a Senior student at the Kansas Agricultural College, has been selected to succeed Mr. Kiene. He visited the Hays Branch Station before Mr. Kiene left and conferred with him on the scope and plan of the experiments now under way. He will not report to Hays for permanent service until after graduation in June.

COLORADO

Akron Experiment Farm, Akron, (F. A. Coffman). Weather conditions during the month of March were rather backward and as a result spring work has been considerably delayed in eastern Colorado. So far no spring seedings have been made on cereal projects. Part of the spring seeding of the Office of Dry-Land farming has been done and it is expected that seeding of spring cereal crops will be completed on Akron Field Station before the end of the first week in April. It is contemplated that about 215 field plats and about one-half acre of spring nursery will be seeded this season.

Very little farming has been done in this section as yet, on account of the backwardness of the season. The condition of the winter grains is excellent. Winter wheat has come thru the winter in fine condition and good stands are assured in all fields examined. On account of the poor market for beans and the failure of spring small cereals for the past two seasons, it is likely that a considerably larger acreage of corn will be planted this year than was last year. Moisture conditions at the present time are very favorable for spring seeding.

WYOMING

Cheyenne Experiment Farm, Archer. (A. L. Nelson). The weather for the past month has been moderate with a number of snows which check soil blowing early in the month and greatly improved winter wheat conditions. On March 25 there was some rain and very wet snow amounting to .39 of an inch of precipitation which stayed placed until melted. This greatly improved winter wheat conditions. Total precipitation for March was 1.00 inch, which is approximately normal. Machinery and harness have been repaired.

Winter wheat on fallow land has made a strong new growth and the field is quite green with generally good stands. Winter wheat sown on oat stubble is improving in vigor and growth. The stand is indifferent. Winter Emmer winterkilled and is a failure.

During the latter part of the month there has been a change in the personnel of the dairy work at the station. There has also been a change in the administration of State Experiment Farms. The full details have not been worked out. However, Dean A. D. Faville, Director of the Agricultural Experiment Station at the University of Wyoming, at Laramie, is Chairman of the Board of Administration.

SOUTH DAKOTA

Belle fourche Experiment Farm, Newell. (A. D. Ellison, April 6). Maximum temperature for the week ending April 5th was 73°; minimum 29°; precipitation, 0.28 of an inch. Owing to the generally fair weather prevailing, much field work was done. The soil was sufficiently dry to be prepared in good shape for spring seeding.

Preparations are being made to begin sowing spring grains the first of next week, but a sleet storm which is occurring today may delay the work somewhat.

NORTH DAKOTA

Dickinson Substation, Dickinson. (R. A. Smith). The weather during the month has been changeable but the temperature has averaged colder than in January. A snow storm on March 15-16 gave about 6 inches of snow, which was more than had fallen in any one storm previously. The minimum temperature for the month was 18 degrees below zero on March 1. The maximum temperature was 54° on March 31. Precipitation for March, 0.5 inch.

With a continuance of the present warm weather, some work may be done in the field this week. There is a little snow remaining in drifts, but the ground is mostly bare and drying fast.

Winter wheat in plats and nursery has suffered some from winter-killing but is not entirely dead. Winter wheat and rye sown last fall, which failed to germinate till November and which did not emerge even then, is still alive, apparently. Winter rye sown in November and which started to germinate in January is also apparently alive, with underground sprouts about one-fourth of an inch long.

Williston Substation, Williston. Mr. C. J. Yackel completed his period of service on April 4 and the cooperative cereal experiments at Williston are now concluded.

MONTANA

Judith Basin Substation. At last reports, Supt. Cardon thought the seeding season would open about the middle of April. Mr. Daniel B. Noble, a senior student at the Montana Agricultural College, had been selected to do the spring seeding and to take charge of the cereal project after his graduation. A better opening has come to him, however, and another man will be chosen.

WESTERN BASIN AND COAST AREAS.

OREGON

Harney County Substation, Burns. (Obil Shattuck). The month of March has been spent in cleaning grain, overhauling the farm machinery, and cleaning up around the farm generally, preparatory to the 1919 farming operations.

The total precipitation for the month of March was .43 of an inch, which is just about the average of the past five years. The maximum temperature was 66° on the 29th, and the minimum was zero on the 7th.

The past ten days have been ideal and the Forkner spring tooth and spike tooth harrows were started March 31 on the station farm.

Sage rats began to get active about the middle of the month, and farmers generally prepared to poison them. Farming operations are beginning generally on the dry-farming lands, but are held up on the overflow lands as the water from the hills has just reached the valley proper.

Sherman County Branch Station, Moro. (D. E. Stephens - March 17.) We have thus far had very fine spring weather. Last night we had .58 of an inch of rain. We hope to get most of our grains sown within the next week or ten days.

Our winter grain nursery includes the following:

134 two-rod rows, pure-line Crimean wheats.) Smutted Seed.
455 head rows, classification nursery.)

85 rod rows, Cereal disease nursery, time of sowing and different varieties smutted with T. tritici and T. levis.
24 four-rod rows, different varieties smutted with T. tritici.
655 head rows, hybrid nursery, winter wheats.
50 four-rod rows, increase of desirable wheats from 1918 classification nursery.

WASHINGTON

Adams Branch Experiment Station, Lind. (M. A. McCall)(March 17). We are seeding and expect to finish everything early next week. We are finishing the field plats this week. Our winter grains are small, but came through with good stands and are growing nicely. Even Early Bart and Winter Barleys came through with very fair stands. Our field Turkey looks good.

Mr. Wanser, the State assistant, will return about April 1.

CALIFORNIA

Chico Experiment Farm, Chico. (V. H. Florell). The 1919 season has begun with conditions generally favorable for all crops. Rainfall has been heavy but reasonably well distributed. The growing season has been slightly delayed by cool weather, but the days are beginning to warm up rapidly.

In general, all cereals are making a good growth. The spring cereals however are progressing much more rapidly than the winter strains. Where the soil is good, spring varieties of barley and wheat have attained a height of a foot or more, while winter varieties in the Classification and Breeding nurseries are only beginning to shoot. One variety of barley, C. I. No. 1113, began heading on March 21, and is fully headed today. No other grains have begun heading. Oats are growing more slowly than wheat or barley.

Flax varieties were resown in the latter part of February and emerged on March 10 with good stands.

The condition of wheat and barley in commercial fields is fair to good. The fall sown grain is especially good. However, the greatest portion of the acreage in this section was spring sown and the sowing of many fields was delayed by the heavy rains. These sowings often show poor stands and retarded growth.

The total precipitation in 1919 has been 13.48 inches, of which 3.38 inches fell in January, 8.00 inches in February, and 2.10 inches in March.

917

MAY 1 - 1919

CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

Vol. 11. ***** No. 7.

April 20, 1919.
Personnel Issue.
***

PERSONNEL - (AGRONOMIC PROJECTS.)

Mr. J. C. Brinsmade, Jr., Scientific Assistant in Flax Investigations, left Washington on April 19, en route to New York, where he will take several days leave before proceeding to the Northern Great Plains Field Station at Mandan, N. D., where he is engaged in flax breeding investigations during the summer.

Mr. C. E. Chambliss, Agronomist in Charge of Rice Investigations, left Washington on April 11 to visit the rice experiment farm at Crowley, La., and supervise the emergency extension of non-irrigated rice in the southeastern United States.

Mr. C. H. Clark, Agronomist in Charge of Flax Investigations, attended a meeting of the Flax Development Committee at Minneapolis on March 27 and 28. While returning from this meeting, he stopped at the Wisconsin Experiment Station to make plans with Prof. C. M. Woodworth for the coordination of flax breeding for agronomic improvement and for disease resistance.

Dr. C. E. Leighty, Agronomist in Charge of Eastern Wheat Investigations, is the author of Year Book separate, No. 769, entitled "The Place of Rye in American Agriculture," recently issued. He also has submitted for publication the manuscript of a Farmers' Bulletin on buckwheat.

Mr. C. W. Warburton, Agronomist in Charge of Oat Investigations, returned to Great Falls, Mont., on April 3, to continue the supervision of seed grain loans under the President's Special Relief Fund. He will be engaged on this work much of the time during the entire summer and early fall, but will devote considerable attention to cooperative experiments conducted on western field stations. While en route to Montana he visited the North Dakota Experiment Station and discussed with Director Trowbridge the proposed new memorandum of understanding.

Mr. C. J. Yackel, who was given temporary appointment last year to take charge of cooperative experiments conducted on the Williston Substation in North Dakota, terminated his period of service on April 4.

PERSONNEL (PATHOLOGIC PROJECTS)

A.- Investigations of Imperfect and Sac Fungi.

Hugo W. Albertz, a graduate of the University of Wisconsin, and for the past two yeats, Secretary of the Wisconsin Experiment Association, has been appointed Agent, effective April 8. He will be stationed at Madison, Wisconsin, and will devote special attention to the Fusarium rot of corn, especially to corn breeding and selection for rot-resistance.

Benjamin H. Duddleston, has been appointed Assistant Pathologist, effective April 4, to assist in the investigation of the Fusarium rots of corn. He is a graduate of the University of Wisconsin and obtained his Master's degree at Iowa State College in 1918, where he conducted special corn investigations. He will be stationed at the Indiana Experiment Station, where important cooperative investigation of this disease is under way.

Leslie M. Ernst, formerly in the employ of Funk Brothers Seed Company, Bloomington, Illinois, has been appointed Bookkeeper and Typewriter, effective March 24. He will assist with the corn disease experiments at Bloomington, where he will keep a record of the experiments under way, and tabulate results thereof.

Eugene Davanport Holden, has been appointed Agent, effective April 16. He will assist in research on the stripe diseases of barley and ergot of rye, in cooperation with the State of Wisconsin, and will be stationed at Madison. Mr. Holden is a graduate of the University of Wisconsin, and was released from the United States Navy shortly before his appointment in this Office.

Dr. A. G. Johnson, has recently returned to Madison from a long field trip in the Western United States. He will soon proceed to Illinois to investigate a wheat disease reported as causing serious damage, and will then come to Washington.

R. W. Leukel, has been appointed Field Assistant, effective March 21, to assist in the investigations of the nematode or eelworm disease of wheat. He reported at Madison, Wisconsin, where he conferred with Dr. A. G. Johnson, relative to the proposed work. He is a graduate of the University of Wisconsin and has been High School Principal and teacher of science at Waunakee High School, Waunakee, Wisconsin. He has been released from military service very recently.

Floyd B. McGregor, was appointed Field Assistant on March 24, for services in connection with the Fusarium rots of corn. He is stationed at LaFayette, Indiana, where the work is being conducted. Mr. McGregor is a graduate of Iowa State College and was employed formerly by the U. S. Geological Survey, as Land Classifier. He was discharged from military service recently.

Harold H. McKinney, was appointed Agent, April 8, to undertake research on Helminthosporium diseases of barley, ergot of rye, and Septoria of cereals at Madison, Wisconsin. From May to September, 1918, Mr. McKinney was under appointment as Field Assistant in this Office, in connection with the barberry eradication campaign. He is a graduate of the Michigan Agricultural College and has done graduate work at the University of Wisconsin.

Merritt L. Shearer, a former employee of the Land Classification Division of the U. S. Geological Survey, has been appointed Field Assistant, effective March 22, to assist in the investigation of Fusarium rots of corn, in cooperation with the Indiana Experiment Station at LaFayette. Mr. Shearer is a graduate of Purdue University and was discharged from the United States Army shortly before his appointment in this Office.

Professor C. M. Woodworth, recently appointed to take charge of special investigation of disease resistance in flax, arrived in Washington recently and is engaged with Mr. C. H. Clark in extensive hybridizing of flax varieties in the greenhouses at Arlington Farm.

B. - INVESTIGATIONS OF RUSTS.

1. - Black and Stripe Rust.

Arrangements are being made to expand the force of Field Assistants engaged on the investigation of black stem rust. The summer campaign will include a study of the relation of the barberry to the spread of rust on the grains and grasses, the collection of rust material over a very large part of the United States, and laboratory and nursery studies of the rusts collected and their behavior on various cereals.

The personnel of this project will be discussed in a forthcoming issue of the Courier.

2. Barberry Eradication Campaign.

Louis Anderson, has been appointed Field Assistant, effective April 7, to assist with the campaign for the eradication of the barberry in North Dakota and surrounding states. He was pursuing a course at the North Dakota Agricultural College at the time of the appointment. Mr. Anderson was discharged from the United States Army shortly after the first of the year.

Clarence E. Baker has been appointed Field Assistant, effective April 7, to assist with the barberry eradication campaign in Illinois and surrounding states, with headquarters at Champaign, Illinois.

John W. Baringer, who has been in charge of overwintering studies of black stem rust in Alabama, was transferred to the barberry eradication campaign, effective April 16, and will act as Assistant State Leader in Ohio, with headquarters at Columbus.

Walter L. Blain was appointed Field Assistant, April 5. He will assist with the barberry eradication campaign in Illinois and adjoining states. Mr. Blain served as Second Lieutenant in the United States Army from September, 1917, to December, 1918.

Reiner Bonde, who was released from the United States Navy on March 1, was appointed Field Assistant, effective March 25, to assist with the barberry eradication campaign. Mr. Bonde was a student at the University of Minnesota at the time he joined the navy.

Lester W. Bullard, has been appointed Field Assistant, effective March 25, to assist with the barberry eradication campaign in North Dakota and surrounding states. He has been discharged from the United States Army very recently and was a student at the North Dakota Agricultural College prior to his enlistment.

Willard M. Coulter, has been appointed Field Assistant, effective March 17, to assist with the barberry eradication campaign in Michigan and neighboring States, with headquarters at Grand Rapids, Michigan. He is now engaged in the campaign in Illinois. He was released from the U. S. Navy shortly before his appointment.

Gordon C. Curran, recently released from the United States Navy, was appointed Field Assistant on April 7, in the barberry eradication campaign in Minnesota.

John R. Fitzsimmons, has been appointed Field Assistant, effective April 7, to assist with the barberry eradication work in Colorado and surrounding States.

Dr. Stanley B. Fracker, Acting State Entomologist of the Wisconsin Department of Agriculture, was appointed a Collaborator of this Office on April 7, to be State Leader of the barberry eradication campaign in Wisconsin, with headquarters in Madison. Dr. Fracker received his Master's degree from Iowa State College in 1913, and his Doctor's degree from the University of Illinois in 1914.

Mr. G. D. George, Illustrator for the barberry eradication campaign, returned to Washington about April first and has since been engaged on the production of an animated cartoon dealing with the barberry and the black stem rust. He has also made line drawings of the common and Japanese barberries, and the Mahonia or Oregon grape, for Dr. Stakman's year book article and a Farmers' Bulletin.

Theophil T. Haack has been appointed Field Assistant, effective March 21, to act as Assistant State Leader of the barberry campaign in Wisconsin. He received his training at the University of Wisconsin and served with the Wisconsin Department of Agriculture for three years. He has recently received his discharge from the Army Air Service.

Randolph O. Helland, formerly Land Classifier in the U. S. Geological Survey, Department of Interior, has been appointed Field Assistant, effective April 15, to assist with the barberry eradication campaign in South Dakota. Mr. Helland is a graduate of the University of Wisconsin.

Robert E. Hodgson, Assistant Pathologist, who had been assisting with the barberry eradication campaign in Minnesota and adjoining States, resigned effective December 31, 1918.

F. Bertil Linfield, a graduate of the Montana State Agricultural College, has been appointed Field Assistant, effective March 17, to assist with the barberry eradication campaign in Montana. Mr. Linfield was under appointment as Senior Land Classifier in the U. S. Geological Survey, Department of Interior, until recently.

Mark A. McCarty, who received his discharge from the Army in February, was appointed Field Assistant, effective March 25. He will assist with the barberry eradication campaign in Minnesota and adjoining states. Mr. McCarty is a graduate of the Minnesota College of Agriculture.

Forest D. McCrea, was on April 11, 1919, appointed Assistant Pathologist to assist with the barberry eradication campaign in Indiana and adjoining States. He is a graduate of Purdue University, and did volunteer work in the eradication of the barberry in Montgomery County, Indiana, during the summer of 1917. He is expected to report for duty on April 26.

Charles W. McLain, who served in the United States Army from July to December 30, 1918, was appointed Field Assistant, effective April 9. He will assist with the barberry eradication campaign in Colorado and surrounding States.

Ralph A. Movold has been appointed Field Assistant, effective March 24, to assist with the barberry eradication work in Minnesota and surrounding States. He has been discharged from military service recently and prior to his enlistment, was a student at the North Dakota Agricultural College.

Harold G. Neff, has been appointed Field Assistant to assist with the barberry eradication campaign in Nebraska, effective April 1. Mr. Neff is a graduate of the University of Nebraska, and during the last two years, has been under appointment as Land Classifier, in the United States Geological Survey, Interior Department.

Glenn E. Paxton, formerly under appointment in this Office as Field Assistant in connection with the smut-control campaign, has been appointed Assistant Pathologist, effective April 16. Mr. Paxton, who was recently discharged from the United States Army, will assist with the barberry eradication campaign in Colorado and surrounding States.

Henry N. Putnam has been appointed Field Assistant, effective March 21, to assist with the barberry eradication campaign in Michigan and adjoining States. Mr. Putnam, who is a graduate of Michigan Agricultural College, assisted with the White Pine Blister Rust work, Office of Forest Pathology, during the summer of 1916. He was discharged from military service in February, this year, having served with the 10th Engineers since August 4, 1917.

Roy H. Quinn, Assistant Pathologist, who has been assisting in the barberry eradication campaign in South Dakota and adjoining States since February, resigned effective March 31 to become County Agent of Garfield County, Colorado.

Prof. A. G. Ruggles, State Entomologist of Minnesota, and Collaborator of the Federal Horticultural Board, has been given authorization as a Collaborator in the barberry eradication campaign conducted in that State. He is charged with the enforcement of the recent State law requiring eradication of barberries.

Herman A. Sandhouse, formerly Instructor in the Department of Animal Husbandry, University of Arkansas, was appointed Field Assistant, April 7. He will assist with the barberry work in Colorado and the various States adjoining. Shortly before his appointment, Mr. Sandhouse was discharged from the U. S. Army where he served since the spring of 1918.

Dr. E. C. Stakman arrived in Washington on April 7, for conference and to complete his manuscript for a Farmers' Bulletin on the barberry and the black stem rust. Dr. Stakman has had charge of the barberry eradication campaign since its inception, having been largely instrumental in organizing it. Effective April 16, he has returned to his cooperative research and other duties at the University of Minnesota. The barberry campaign will be directed from the Washington Office from that day forward.

Lloyd E. Thatcher was appointed Field Assistant, March 12, and will assist with the barberry eradication campaign in Nebraska and surrounding States. Shortly before his appointment in this Office, Mr. Thatcher was released from service at the Great Lakes Training Station, Great Lakes, Illinois.

Wilbur A. Thomas has been appointed Assistant Pathologist, effective April 16, to assist with the barberry eradication campaign in Iowa and adjoining States. Mr. Thomas served as Second Lieutenant in the Coast Artillery, from June 26 to December 21, 1918. He is a graduate of Grinnell College, Iowa.

Josephine Waldron, has been appointed Stenographer and Typist, effective April 1, 1919. She will be stationed at Lafayette, Indiana, and will assist Professor H. S. Jackson, State Leader in the barberry eradication campaign.

C. - CEREAL SMUT INVESTIGATIONS.

Sylvia C. Fuson, of theDepartment of Botany of the Miami University, Ohio, has completed her laboratory experiments to determine the injury resulting from seed treatment for cereal smuts, and her appointment has been terminated April 2.

Charles S. Reddy left Washington early in April for an extended trip in the Eastern and Central States to supervise the experiments being conducted in several States to determine the cause of seed injury during seed treatment for cereal smuts. He will also make arrangements to transfer the men engaged in the smut control campaign in Northern States to the smut survey about to begin in the South.

V I S I T O R S

Prof. L. R. Abrams, from the Department of Botany, Stanford University, was an Office visitor on April 15.

Prof. J. R. Fain, Agronomist in the Georgia College of Agriculture, was in the Office on April 17 and 18 to discuss the rearrangement of cooperating personnel in Georgia incident to the return of Mr. Childs to the College.

Director E. C. Johnson, of the Washington Agricultural Experiment Station, discussed present and prospective cooperative investigations in that State on April 19.

Dr. L. R. Jones, Editor of the Department of Botany of the Wisconsin Agricultural Experiment Station, was in conference on April 17 concerning the cooperative cereal disease investigations at that Station.

Prof. L. E. Rast, of the Department of Agronomy, Georgia State College of Agriculture, was an office visitor about the middle of April. He was then en route to New York to sail for the West Indies for a special investigation of cotton problems.

Dr. P. F. Trowbridge, Director of the North Dakota Experiment Station, discussed the reorganization and extension of cooperative experiments in that State on April 18.

.9
6917

MAY 2 1919

C E R E A L C O U R I E R.

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION.)

oooooo

Vol. 11 May 10, 1919. No. 8.
Field Station Issue.

PERSONNEL - (ADMINISTRATIVE PROJECT.)

Miss Katheryn L. Foley, Clerk-Typist, was transferred from the Office of Fertilizer Control to this office, effective April 21, on completion of the work of that office. She is assigned to the administrative project.

Mr. Hugh S. Smith has been detailed from the Office of Congressional Seed Distribution, effective May 6, to assist with our finances during the summer period. His long experience in the Department and his knowledge of fiscal affairs and bookkeeping will be of much value during the emergency period.

PERSONNEL - (AGRONOMIC PROJECTS.)

Dr. H. V. Harlan left Washington on Friday to sail for Europe on Saturday, May 3, in company with John D. Shanahan of the U.S. Food Administration Grain Corporation, and Mr. E. G. Boerner of the Bureau of Markets. The party will assist in collecting special statistics on crop production in Europe for use in estimating food requirements of European countries.

Dr. C. E. Leighty left Washington on May 6 to visit the localities in Illinois and other States where the supposed Take-all disease of wheat has been reported. He will make a determination of the varieties affected and the sources of the seed used in sowing them, in order to discover, if possible, the source from which this disease and the flag smut has been introduced into the United States.

Miss Helen Johann was appointed, effective April 5, for laboratory service in the cooperative investigation of wheat scab and the related fusarium rots of cereals at the Wisconsin Experiment Station. She reported for duty on May 1. Miss Johann is one of the few specialists in the study of the complex genus Fusarium. She is a graduate of the University of Missouri and has been a research assistant in pathology at the Missouri Agricultural Experiment Station.

Miss Vera McGinnis has been appointed mess cook and caretaker at the Cheyenne Field Station, Archer, Wyoming, effective April 25.

Mr. J. B. Sieglinger visited the Field Stations at Amarillo and Dalhart, Texas, and Tucumcari, New Mexico, during the latter part of April. An account of his observations will be found in this issue in connection with the report of the Woodward Field Station.

Mr. C. V. Warburton visited the Montana Experiment Station at Bozeman on April 22 to complete, in conference with Director Linfield, the proposed new memorandum of understanding to cover future cereal investigations in that State.

PERSONNEL (PATHOLOGIC PROJECTS).

A. INVESTIGATION OF IMPERFECT AND SAC FUNGI.

Dr. A. G. Johnson left Washington on May 3 for St. Louis to meet the representatives of this Office engaged in the cereal smut and rust surveys, in order to help them to become familiar with the supposed take-all disease of wheat in adjacent Illinois. After studying it and the recently discovered flag smut in the fields there, they will be enabled to recognize these diseases if they are met with in other cereal-growing States.

R. E. Vaughan, State Pathologist in Wisconsin and Collaborator in the Office of Plant Disease Survey, has been given travel authorizati effective April 21, by this Office, for a trip to Osage and Ames, Iowa, investigate seed treatments for stripe diseases of barley.

Professor C. M. Woodworth has completed the making of reciprocal crosses of flax varieties in the greenhouse at Arlington, and has returned to Madison, Wisconsin, to continue his cooperative investigations of disease resistance in flax.

B. INVESTIGATION OF RUSTS.

1. Black and Stripe Rust.

Miss Dorothy M. Powers, Stenographer and Typist, was transferred from Biophysical Investigations to this Office on May 7, and has been assigned to assist Dr. Humphrey in the Black and Stripe Rust project.

S. Fred Prince, who has been assisting with the investigations of black and stripe rust and other related cereal diseases at Manhattan, Kansas, since December first, last year, has resigned effective April 30. Mr. Prince will return to his former position at the Kansas State Agricultural College.

Karl S. Quisenberry, has been appointed Agent, effective May 1 to take charge of wheat breeding nurseries in which cooperative experiments in breeding and selection of strains for rust resistance and winter hardiness will be conducted at the Agricultural Experiment Station, Manhattan, Kansas.

2. Barberry Eradication.

John M. Gazett, a graduate of the North Dakota Agricultural College, has been appointed Field Assistant, effective April 25, to assist with the barberry eradication campaign in North Dakota and surrounding States. Mr. Gazett was discharged from the U. S. Army in December, where he had been serving since May, 1918.

Robert M. Groesbeck has been appointed Field Assistant, effective April 25, to assist with the barberry eradication campaign in Minnesota and surrounding States. Mr. Groesbeck served with the United States Army for more than a year, and was discharged shortly before his appointment in this office.

Earl A. Heassler, has been appointed Field Assistant, effective April 25, to assist with the barberry eradication campaign in Wisconsin and neighboring States. Mr. Heassler served with the United States Army as Second Lieutenant during the past year. He assisted with the eradication of the White Pine Blister Rust, Office of Forest Pathology, in Wisconsin, during the summer of 1917.

John E. Lysen, recently released from the U. S. Naval Reserve, has been appointed Field Assistant, effective April 26. Mr. Lysen will assist with the barberry eradication campaign in Minnesota and adjoining States.

Harrison R. Noble, a graduate of Wisconsin College of Agriculture, has been appointed Assistant Pathologist, effective April 26, to assist with the barberry eradication campaign in Wisconsin and surrounding States. Mr. Noble served with the United States Army as Second Lieutenant during the war.

Hubert L. Person, discharged from the U. S. Army in December, 1918, has been appointed Field Assistant, effective April 23. He will assist with the barberry campaign in North Dakota and neighboring states.

Homer H. Plagge, who during the summer of 1918 assisted with the smut control campaign conducted by this Office, has been appointed Assistant Pathologist to assist with the barberry eradication campaign in Iowa and surrounding States. The appointment was effective April 23. Mr. Plagge has been Instructor in Botany at the Iowa State College since he resigned as Assistant Pathologist on September 30, 1918.

Professor James P. Poole, State Pathologist of Wyoming and Collaborator of the Plant Disease Survey, was appointed State Leader of the barberry eradication campaign in Wyoming, effective May 1. His headquarters will be at Laramie.

R. H Porter, who has been engaged in smut control in Iowa since January, has been transferred to work in connection with the barberry eradication campaign, effective May 1. He will remain in Iowa, with headquarters at Ames.

William L. Shovell has been appointed Assistant Pathologist, effective May 3, to assist with the barberry eradication campaign in Montana. Mr. Shovell, who is a graduate of the Montana State College, has been employed as Horticultural Inspector for the Montana State Board of Horticulture, for several years.

Wilmer G. Stover, who has been assisting with the smut control campaign in Ohio, since February, 1918, has been transferred to barberry eradication effective April 22. Mr. Stover will act as State Leader of the barberry campaign in Ohio, with headquarters at Columbus.

Professor Alva L. Strausz, State Horticulturist of Montana, has been appointed Collaborator, effective April 25. Professor Strausz will assist with the barberry eradication campaign in Montana and surrounding States, with headquarters at Missoula.

John C. Wood, formerly Orchard and Nursery Stock Inspector, for the State Board of Horticulture, Montana, has been appointed Field Assistant, effective May 3, to assist with the barberry eradication campaign in Montana and surrounding States.

D. INVESTIGATIONS OF SMUTS.

F. F. Blaine, in company with Professor C. W. Temple, State Pathologist of Maryland, spent April 30 to May 5 in a careful study of wheat conditions in eastern Maryland. Numerous reports have been received of extensive injury in wheat in that section, supposedly due to effects of the dry method of seed treatment.

Newton C. Brackett has been transferred from the barberry eradication campaign in Iowa and will assist in the survey of Alabama.

W. E. Brentzel, who has been assisting in the smut eradication campaign in North Dakota, has been transferred to investigations in connection with flax diseases in that State.

Dr. R. O. Cromwell, previously in charge of the smut eradication campaign in Iowa, has been transferred to an intensive survey of the distribution of wheat scab.

J. T. Fowler has been transferred to the survey in Alabama. Mr. Fowler was formerly on the barberry eradication staff in Nebraska.

George H. Gillespie, recently with the barberry eradication campaign in Nebraska, has been returned to smut eradication and will proceed for survey work in Texas.

Mrs. Mary L. Iansdale, who since January 23 has been assisting in compiling and tabulating data collected by field men employed on the seed treatment campaign for cereal smut control, resigned effective April 22.

Professor W. C. Stover, leader of the smut eradication campaign in Ohio, has been transferred to the leadership of the barberry eradication campaign in the same State.

FIELD STATION CONDITION AND PROGRESS.

HUMID EASTERN STATES
(South to North.)

LOUISIANA

Crowley Rice Station, Crowley. (J. Mitchell Jenkins.) No Report.

GEORGIA

State Experiment Station (Athens) and Substations. (R. R. Childs.)
No Report.

TENNESSEE

State Experiment Station, Knoxville. (C. A. Mooers) No Report.

NORTH CAROLINA

State Experiment Station, West Raleigh. (G. M. Garren) No Report.

VIRGINIA

Arlington Farm, Roslyn. (Henry P. Ames) The weather prevailing at Arlington Farm and the surrounding country in April, was favorable to the growth of cereal crops. However, the low temperatures in the early part of the month caused the leaves of winter oats to turn reddish brown. The maximum temperature for the month was 80 degrees on the 7th, and the minimum was 22 degrees on the 2nd. The total precipitation for the month was 3.53 inches. Of the total amount, 1.95 inches occurred on the 12th.

Practically all of the winter barley and rye in the field plats and nurseries have begun to head since the 15th of April. Fulghum (oats), C. I. No. 708, has begun to head, and Nebraska Hybrid No. 28 (wheat), C. I. No. 5147, appears to be near heading. The cereal nurseries were hand-hoed during the month.

The spring grain aphis, commonly known as the green bug, appeared in large numbers on winter oats during the first two weeks of April. While they were present also on the wheat and barley plants, they were not as numerous as on the winter oat plants.

NEW YORK

Cornell Experiment Station, Ithaca. (H. H. Love.) Cool weather and frequent rains have hindered spring work in central New York considerably. The farmers are not yet thru seeding oats. Possibly they are about half thru. It is likely that most of the spring wheat is in and barley seeding will be under way next week if the weather is good. Winter wheat is looking very well owing to the good growing weather for wheat and grass that we have had.

On our experimental plats here during the last week, we have finished seeding spring wheat, oats and barley, including over 4000 rod rows and a number of increase plats in duplicate. In addition, certain of our more promising strains have been sown on larger plats to increase seed for distribution to the farmers. All of our oat hybrids have been sown and most of the barley hybrids. During the present week rod row series of oats are being sown out in the State, namely, in Lewis, Jefferson, and Steuben counties. In these counties the same varieties are being grown in rod rows, repeated ten times in each place. In addition to this, a number of our more promising selections are being sown in drill plats in a number of sections in the State. Similar seeding of rod rows from new selections will be made in Cayuga and Onondaga counties the week beginning May 12. The wheat hybrids, which were sown in the greenhouse in the fall, are now maturing and are furnishing much interesting material. There is considerable sterility occuring, particularly in the species crosses, and Mr. Ernest Dorsey is working on the cytological and histological phases of this trouble.

MISSOURI

State Experiment Station, Columbia, (L. J. Stadler) The cropping season opened most favorably in Missouri. The April condition of wheat was higher than that of any year on record except 1882, and the acreage is 36% higher than that of last year. Oats and spring wheat seeding were practically completed by April 1. The weather during the month of April has been generally favorable. Plowing for corn made satisfactory progress during the month, after a slow start, and corn planting is now well under way in the southern third of the state. Meadows and pastures are in excellent condition.

Cooperative experiments at the station this year include rod-row plots of wheat, oats, and barley. The oats and barley plots were started this year, the former with forty varieties from the varietal classification of W. C. Etheridge, and the latter with thirty varieties from the classification of H. V. Harlan. The rod-row plots now include over 3500 rows. They are in exceptionally good condition, as are all the other small grain plots on the station farm.

IOWA

State Experiment Station, Ames. (L. C. Burnett) Continuous rain kept us out of the field from April 5 to April 18. There were about three hours of sunshine during the period. The cereal nursery was sown on the 19th instead of on the 12th, as expected.

Continued rain allowed but little work during the week ending April 26. The varietal plots were sown on April 21, 25, and 26. Rain was falling again on April 27 and continued throughout the week. Wheat growth was so rank that jointing was expected during the next few days.

GREAT PLAINS AREA
(South to North.)

TEXAS

Amarillo Cereal Field Station, Amarillo. (John F. Ross) Following the very dry summer of 1918 the late fall and winter were blessed with an abundance of moisture. The precipitation from the first of October to the first of April amounted to 8.31 inches. A large part of this came as snow. Of the amount given above, 6.20 inches came the last three month in 1918. Snow covered the ground from December 17 to January 23, when bare ground began to show up in places. During the latter part of February and early in March the ground became badly cracked and considerable soil blowing took place in various parts of the Panhandle country. It has been estimated that 10% of the wheat was blown out. That remaining certainly looks good. The prospects for good crops are better than they have been for many years at this season of the year. Good rains the latter part of March and early April put a stop to most of the soil blowing.

Summary of Weather Conditions for April:- The maximum temperature for the month of April was 87 on the 22nd; minimum 25 on the 10th; the average wind velocity 8.5 miles per hour; precipitation 2.51 inches, and evaporation about 5 3/4 inches. The evaporation tanks were filled with snow for a few days during the storm of the 9th and 10th, so that an accurate measurement of the evaporation could not be made. The blizzard and freezing weather on the 9th and 10th did considerably damage to the fruit. Field crops were damaged some, but soon recovered. They are looking as fine now as I have ever seen them look at this season of the year. Winter rye began heading April 30. Wet weather has hindered farm work to a considerable extent but the work at the station is pretty well up. Farmers in the surrounding country are busily preparing land for spring row crops.

Mr. J. A. Stinson, unskilled laborer, resigned from the service on the 17th and went back to his old job in a grocery store where he was given more money than he was getting here.

Mr. Louis N. Jensen, Assistant in Dry Land Agriculture, resigned from the service on April 30. No one has been sent yet to take his place.

On the morning of May 1, the farm force consisted of John F. Ross, superintendent, and Jacob F. Stump, teamster. Robert W. Cohlmeyer began work as a laborer on the farm that day, so there are three of us here now.

There are two airplanes in town today to assist in the Victory Liberty Loan drive.

OKLAHOMA

Woodward Field Station, Woodward. (John B. Sieglinger)
Report for Cereal Work at the Woodward Field Station for April: The work for April has been thrashing broomcorn and sorghum seed heads in preparation for the main seeding to be done about May 15, running germination tests, sacking up seed for shipment, seeding the first two dates of the date-of-seeding experiments, and other preparatory work. The land for the cereal project is all ready for seeding. The writer also took an auto trip to the Amarillo, Dalhart, and Tucumcari Field Stations, which lasted one week.

The first date-of-seeding plats, consisting of a plat each of Acme broomcorn, dwarf milo, Sunrise kafir, sumac and red amber sorgos, were seeded on April 15. The dwarf milo emerged to a stand April 29 and the remainder of the varieties emerged April 30. The long time required for the first date plats to emerge was due to the wet cold condition of the soil. The second date-of-seeding plats were seeded today, April 30, and consisted of the five above mentioned varieties and a plat each of Dawn kafir, C. I. No. 340, feterita, C. I. No. 182, and blackhull kaoliang, C. I. No. 310, in addition.

The rainfall to date this year has been:- January, 0.00, February 1.53 inches, March 1.90 inches, and April 3.79 inches, or a total of 7.22 inches of precipitation, as against a 24 year average (1895 to 1918 inclusive) of 5.03 inches. The last killing frost was recorded on April 10 when the temperature was 31°. The average date for the last killing frost in the spring is April 12. The maximum temperature for the month was 88° on April 22. At present the soil is full of moisture and conditions for a bumper wheat crop in this part of the country were never better. There is such a large acreage of wheat that there will not be much land for spring rowed crops.

Labor conditions seem to be easier as a large number of boys are returning home from the army.

Notes on the Panhandle Section.

With Mr. E. F. Chilcott, I visited the Field Stations at Dalhart and Amarillo, Texas, and Tucumcari, New Mexico, in the period April 2-8. For the first 20 miles out of Woodward about 90 percent of the cultivated land was in wheat and it was all looking good, the best prospects for a big wheat crop they have had. The stand was good and we saw very little that had blown out. From Chaney, Okla., to Lakemp, Okla., about 50 percent of the cultivated land was in wheat, as they seemed to have raised more sorghums and did not put the sorghum land in wheat. Between Lakemp, Okla., and about 20 miles west there were at least 10 piles of baled broomcorn, most of which had no protection from the weather and was black in appearance, and probably a total loss. On the road we traveled there must have been at least 40 tons of broomcorn baled and piled out. From Lakemp to Goodwell, Okla., there was about one-third of the cultivated land in wheat. From Goodwell, Oklahoma, to Amarillo, Texas, there was little land in cultivation except a few wheat fields around Dalhart.

Between Amarillo, Texas, and the breaks to the west, there is a high percentage of the cultivated land in small grain, more oats than we saw at any other part of the trip. The oats are looking good and will soon hide the ground.

At the Tucumcari Field Station, the first date-of-seeding plats of sorghums were seeded on April 15 and were up to a stand April 23. Mr. Brown expects to seed most of the grain sorghum experiments about May 15, weather being favorable. He had just finished plowing the land for these experiments.

From Amarillo, Texas, to Conway, Texas, about two-thirds of the cultivated land was in wheat and from Conway to Jerico, Texas, about 80 percent was in small grain. Around Groom, Texas, the wheat was about 10 inches to a foot in height. From Alanreed, Texas, to Shamrock, Texas, most of the land was being prepared for row crops. Right north of Shamrock there were a number of fields of wheat which looked very good, but not so tall as that near Groom. Most of the trip from Shamrock to Canadian, Texas, was made after dark. From Canadian to Higgins, Texas, there was not much farming on the route we traveled. From Higgins, Texas, to Gage, Oklahoma, wheat occupied about 75 percent of the cul-

tivated land and was in good condition. Throughout the entire trip bound feed was conspicuous by its absence. The entire country through which we passed had a good rain, as it stayed in front of us on the return trip.

KANSAS

Fort Hays Branch Station, Hays. (Arthur F. Swanson) No Report.

COLORADO

Akron Experiment Farm, Akron. (F. A. Coffman) April was a rather busy month at Akron Field Station. All of the Cereal Investigations seedings of spring wheat, oats, barley, and emmer were made during April. A total of 214 field plats, 48 nursery plats, 310 nursery rows, and 1000 individual seedings has been made. With the exception of a few of the nursery seedings, all of the grain has emerged. Good stands have been secured in almost all plats and with the ideal weather conditions now existing, it is almost possible to see the crops grow.

Winter wheat and rye are in excellent condition. The wheat prospects are at the present time the best northeastern Colorado has known for many years. Some estimates give the winter wheat condition as being 110 percent in this section of the country. After witnessing the season of 1918, the writer refuses to make any predictions as to the crop likely to be produced. Stands of spring wheat and barley are better than usual in this part of Colorado. Sufficient moisture has been received to keep the crops in fine growing condition.

Farmers are very busy at the present time preparing land for corn. Good yields and high prices have greatly stimulated the growing of corn in eastern Colorado.

Weather conditions in this section have been very favorable, as a whole, during the past month. A severe blizzard struck Akron Field Station on Sunday, April 6. The snow piled up in drifts 6 to 8 feet deep in many places on the station. It took two weeks for some of the drifts to melt. The lowest temperature reached during April was 16° on April 8, while the highest temperature registered was 79° on the 23rd. Total precipitation for the month was 2.24 inches. The largest precipitations were 0.63 inches of rain, hail, and snow on April 7, and 0.85 inches of rain on April 28.

WYOMING

Cheyenne Experiment Farm, Archer. (A. L. Nelson) The month of April was very dry with a precipitation of .58 inches. The greater part of this came in the form of snow on April 6, and drifted from the land. This makes a very small amount of precipitation entering the soil. The temperature has been somewhat above normal and the wind moderate.

The soil is becoming so dry in places that plowing is difficult. Sod land and land with considerable volunteer grain is too dry to plow and clean stubble land is fast becoming dry.

Winter grain is looking well, especially that seeded on fallow, but continued dry weather will do considerable damage. Farm work commenced on April 1, but has been slightly delayed due to snow on April 6. Since April 15, there have been three men working on the farm in addition to Mr. Burtis, who has charge of the Dry-Land Agriculture projects.

SOUTH DAKOTA

Belle Fourche Experiment Farm, Newell. (A. D. Ellison)
Cottonwood Substation. (Manley Champlin)
Highmore Substation. (E. S. McFadden)
Eureka Substation. (Manley Champlin)
Brookings. (Manley Champlin)

Newell, (April 14). A snow storm occurred on April 7 which put a stop to all field operations for the week. The ground was drying sufficiently to permit field work when another snow storm occurred on the 13th and on the morning of the 14th. Maximum temperature for the ending April 12, 55 degrees; minimum, 12 degrees; precipitation, 0.95 of an inch.

Winter wheat seems to be in good condition this spring. Several nearby fields are showing up green in spite of the late, cold spring. Sufficient precipitation has fallen, it appears, to warrant good crop yields. Few farmers on the project have sown spring grains as yet. Many fields are in shape for seeding, but owing to the recent storms the work generally has been delayed.

(April 30) Generally fair weather prevailed during the last half of April. Practically all the precipitation recorded for the month occurred before the 15th in the form of snow. The surface soil at the present time is quite dry and is being shifted greatly by the wind. Maximum temperature for the period from April 15 to April 30 was 77 degrees on the 20th and 22nd; minimum, 26 degrees on the 16th; precipitation 0.07 of an inch. The total precipitation for the month of April was 2.14 inches, being 1.83 inches above the normal for April up to 1917.

Spring wheat, oats, barley, and flax have been sown in field plats and in the cereal nursery under both dry and irrigated conditions. Spring wheat sown on the dry land on April 18 has emerged and is making fairly good growth. Flax sown on April 19 in the date-of-seeding experiment on dry land has also emerged. The soil was in good tilth at the time of sowing spring grains, so a reasonably good germination of cereals sown is expected.

Farming operations on the farm in general are progressing in good shape. All small grains in the various experiments have been sown and are beginning to emerge. Preparations are geing made to plant potatoes and the areas to be devoted to corn under both dry and irrigated conditions are being worked into shape.

Farmers in the vicinity of the farm apparently are making every effort possible to increase their crop acreage and to get their crops in at an early date. Much interest is shown by the farmers on the project im obtaining and growing the best of profitable crops; also, in raising good grades of profitable livestock.

Brookings. Seeding is practically complete, but averages about a week later than usual on account of wet weather during the period from April 1. to 20, there being very few days when it was possible to do field work. Three new cooperative experiments have been added, one with regard to the biologic forms of rust, another on the method of treatment for smut and the third on the winnowing of uredospores. The weather is now warm and clear, and grass and early sown grain are making good pregress. Winter grain came through in good shape. Work in the vicinity is progressing nicely.

Cottonwood. Seeding of spring cereals is in progress, but is not yet complete. The nature of the soil at Cottonwood, a heavy, sticky gumbo, is such that it cannot be worked to advantage when it is wet. This has somewhat delayed the spring seeding and emphasizes anew the value of biennial, perennial, and fall-sown crops at this station.

Eureka. Spring seeding is completed. The winter rye survived with a good stand, but all the winter wheat has killed and also spring barley, spring oats, and spring wheat seeded in the fall have failed to come through. This is the second year of the test of fall seeding spring grain and so far the results have been negative each year.

Highmore. All cereal nurseries have been sown and the field seeding is nearly complete. The same additional experiments with cereal diseases have been started at Highmore as at Brookings. Mr. E. S. McFadden has been appointed assistant superintendent in charge of scientific work on the Station. Mr. S. W. Sussex continues as farm foreman in charge of general farm management, labor, etc., as formerly.

Vivian. Seeding of small grain is complete. Mr. Chas. Sayder, foreman, reports that alfalfa seeded with winter rye last fall came through the winter in good shape. This is the second time that a successful survival of alfalfa has been secured by seeding with winter rye at this station and is gratifying because winter rye and alfalfa are two crops that are becoming more and more important in that section of the state.

General. The past winter has been comparatively mild. In most localities live stock wintered in good shape as did also winter rye and winter wheat. There is comparatively little complaint about alfalfa winter killing, although some was destroyed last fall by grasshoppers or too close grazing.

NORTH DAKOTA

State Experiment Station, Agricultural College. (Theodore Stoa)

(April 15) The early part of April was promising for an early spring, though the temperature remained low. Rain, turning to snow, persisted for several days after April 5. At present the weather is remaining cool, and does not tend to dry very rapidly. Scattered farmers have begun field work, but very little seeding has been attempted. No field work is under way at the station. The precipitation for April 1 to 15 was 1.79 inches. Average maximum temperature 46°, average minimum temperature 34°. A maximum temperature of 60° occurred April 5. The lowest temperature recorded for this period was 30° on April 1 and 9.

The labor situation is yet a problem in this region. Men are not very abundant in spite of good wages.

(April 30) The past ten days have been very favorable for doing spring work and much seed has gone into the ground. Farmers have about completed their wheat seeding. In the plat work at the experiment station, all wheat and oats plats have been seeded and some barley. The season is later than usual. The weather has remained rather cool, only an occasional warm day occurring. No wheat has yet emerged on the station grounds, but it is germinating nicely. All grass plats appear to have come through the winter in fine shape.

Northern Great Plains Field Station, Mandan, (J.C.Brinsmade, Jr.)
Climatic and soil conditions appear to be exceptionally favorable so that prospects for a good crop season are very promising. The abundant snowfall of April 7 and 8 melted slowly with practically no run-off, and there have been little showers from time to time which have left the soil in moist, easily workable condition. Total precipitation for the month was 1.44 inches. Maximum temperature for month was 75°, recorded April 19, 21, and 30; the minimum was 18°, recorded April 24.

The winter wheat nursery, of which only a very small part started to come up last fall, emerged about April 20.

The first sowing of the date-of-seeding experiment with flax, sown April 15, is just coming up today. The second date of seeding was sown today. The regular flax sowings will not be made until after May 15.

The wheat varietal plats were sown April 25, oats April 26; and barley, April 30. Land is all prepared for the wheat nursery, and the seed will be sown May 2 if weather permits.

Messrs. Reddy and Brentzel were here April 28 attending to the sowing of a pathologic experiment with flax.

Dickinson Substation (Ralph W. Smith)
(April 15) So far the spring has been rather backward, several snowstorms and a rain occurring to delay field work but furnishing a good supply of moisture which is much needed. Since the beginning of April the precipitation has been about 1.2 inches which is nearly the normal for the month. About half of this occurred during the blizzard of April 7 and 8. The snow is nearly gone now and a few farmers are able to work in the field on the higher ground. The plats on the Substation are still too wet to work but we expect to be able to get in the field in a few days. Grain is being prepared for seeding so that once field work begins seeding can go forward without delay.

(April 30) The seeding of wheat was delayed about 10 days in this vininity by the blizzard and resulting moisture. Some farmers are still sowing wheat but most of the wheat seeding is finished.

The replicated varieties of wheat and oats in plats and also the rotation plats were sown last week. The work of sowing about 900 rodrows of wheat was finished today. Oats and barley in rod rows and the head rows of wheat are yet to be sown.

The subsoil is exceedingly dry but the surface soil contains sufficient moisture to germinate seed now in the ground. The total precipitation for the month was 1.36 inches which is slightly above normal. Most of this moisture fell during the blizzard of April 7 and 8. There has been considerable windy weather which has rapidly dried out the soil during the past 10 days.

Dickinson Substation - Con.

There is a prospect of an abundance of grasshoppers in this county and the County Agent and Farm Bureau for this (Stark) county are making plans to begin a systematic poisoning campaign as soon as the young hoppers appear.

MONTANA.

Judith Basin Substation, Moccasin (P.V.Cardon)

Daniel B. Noble, a senior student at the Montana Agricultural College, was detailed by the State Experiment Station to the Judith Basin Field Station at Moccasin, to do the spring seeding in the cereal experiments. He arrived at Moccasin April 17, and finished the work on April 28.

All of the cereals have been sown under favorable conditions. The winter grains, as a whole, are up with good stands and there is every promise of the spring stuff coming along nicely. We have had no rain this month to speak of, which has made it possible to do practically all of the rush work. A storm is now threatening and everything is in readiness to receive rain to the best advantage. Soon I shall report in detail on the winter survival of the fall-seeded grains.

CROP CONDITIONS IN MONTANA (C.W.Warburton)

Conditions in Montana are not particularly favorable as there has been little moisture during the winter and spring and the soil is now dry. Nearly all reports indicate that winter wheat and rye came through the winter in fairly good condition, though there has been some loss from soil blowing and from drying out because of severe wind storms, one of the liveliest of which we had the day after my arrival here. We had a few drops of rain yesterday afternoon and an occasional snow flurry has fallen this morning, but there is no prospect of sufficient moisture in the near future to do any real good. Seeding is under way, but the ground is really too dry to plow well or to make a good seed bed.

Conditions are rather better in North Dakota as considerable snow and rain fell there between April 5 and 8. The precipitation amounted to as much as 1-1/2 inches in the eastern part of the State.

WESTERN BASIN AND COAST AREAS (South to north and West)

UTAH.

Nephi Substation, Nephi. (Aaron F. Bracken)

During the past winter 4.06 inches of precipitation fell from November 1, 1918, to March 31, 1919, inclusive which is 1.97 inches below normal. During April the rainfall has amounted to .75 inches which is also below normal to the amount of .59 inches. A large part of the winter moisture was lost. Before snow covered the ground last November the soil was frozen to a depth of at least fifteen inches and remained frozen until March. During the first warm days of spring all the snow melted but the soil was still frozen with the exception of about three inches on the surface. Since the frozen layer stopped the natural downward movement of the water the surface was completely saturated and considerable run-off occurred. The loss of moisture, however, was not as serious as the physical condition resulting from the puddling of the surface. April began with warm weather and an unusual amount of wind and this, together with the low rainfall for the month, baked the surface of the soil into an extremely hard crust. This condition of the soil has allowed such extensive evaporation that the surface foot is extremely dry for growing plants which are now attempting to develop permanent roots. Grain which emerged before snow covered the ground last fall is looking very well even though the soil condition is unfavorable and thick stands are growing faster than those which are about right for surviving a drouth.

Seeding of fall grains on the station began October 9 and ended October 25. All grain which was sown before the 16th of October emerged before cold weather began; grain seeded after this date did not emerge until some time during the winter. The plots in the rotation experiments and the nursery rows were not seeded until after the 16th of October, 1918. The grain which emerged before winter formed a crown near the surface and is well tillered; the grain which did not emerge before winter of necessity has formed a crown at least an inch and a half below the surface and the pinched plants have very little opportunity to tiller. Rain is needed to soften the soil.

All grains came through the winter with good stands with the exception of the winter oats. Almost every plant of winter oats winterkilled.

Due to unusual high temperatures for April and the dryness of the soil, spring work has come on unusually early. All spring grains have been seeded and have emerged with good stands; the spring soil sampling is finished; all plots in rotation experiments, plowing-methods experiment and cropping systems have received treatment according to plan; roads and alleys have been cleaned; and spring plowing of plots used for all other experiments is almost finished.

For severalyears the farm has been very much in need of a mower and a rake. These implements have been added to the station equipment and in addition a new harrow was purchased. More machinery necessitated the building of another shed. The new one is 16 by 26 feet.

IDAHO.

Aberdeen Substation, Aberdeen. (L.C.Aicher)

Weather has been fine for farm work up until April 29, when a terrific windstorm started in and it has not stopped yet. Today real estate is moving mighty rapidly via wind. Farm work has been stopped for two days. Rain is needed badly to bring up small grain and beets. The irrigation water is to be turned into the canal system May 1 and will reach Aberdeen in about three days. Unless rain comes soon farmers will be forced to irrigate much more than usual for this time of the year.

The former dry farm on the Station is slowly being made ready for irrigation. The labor situation, insofar as team help is concerned, is beginning to look more favorable. One outfit was obtained yesterday to do leveling and ditch work until the farm is ready for seeding down. It is planned to seed the new irrigated land to alfalfa as a forerunner to future farming operations.

Single hands are very scarce as yet. The nursery planting is going very slowly. One new man is coming Monday to help out in this work. There has not been a time since this Station was established when help was so scarce and hard to get as it is right now.

The farmers in this end of the county are preparing much better seed beds than formerly. Much of this is due to use of proper machinery and getting on the plowed land immediately after plowing. The roller is being used very extensively now. This station brought the first roller into this section in 1914.

The sugar-beet industry is spreading out all over this end of the county. Last year 1200 acres were signed up. This year the total number of acres of beets planted will exceed 2500 acres. The by-products of the beet industry are beginning to be used for cattle feeding. This past winter and spring several hundred head of cattle were fed beet top silage and alfalfa hay and finished off with corn. One of the largest feeders stated that his alfalfa brought him $18.00 per ton fed to the cattle on his place and he will have about 500 loads of manure for his land. He contemplates continuing feeding cattle, and stated that it is one of the most profitable of all his operations.

Early sown crops are growing very rapidly. Much wheat is being sown. More would have been sown if seed had been available. Oats, barley and beets are being planted instead. Dicklow has firmly established itself here now and next year all wheat sown on irrigated land will be Dicklow. Farmers have paid $5.00 per hundred pounds for just ordinary run of seed wheat if it was Dicklow. Trebi barley is traveling like wild fire all over irrigated southern Idaho. About 150,000 pounds were distributed from Aberdeen this winter and spring. There is a great demand for good seed oats and it is hoped that this Station can meet this demand after harvest this fall.

Wheat on the dry lands is looking good. Gound squirrels are working havoc now, however, and the demand for poison exceeds all supply at this time. Over 200 ounces of strychnine alkaloid were distributed to farmers during the past month. Several thousand ounces have been distributed by the County Agent in Bingham County.

The cereals and peas are all up and looking well. We have an excellent stand and very uriform. Mother beets for seed production were planted very early this year and are growing rapidly. 150 selected mother beets were analysed for sugar content by the Chemist of the Idaho Experiment Station in cooperation with the Superintendent. Some very interesting information regarding sugar content and size of beets has already been obtained.

OREGON.

Harney Branch Station, Burns. (Obil Shattuck)

(April 15) The first half of April was spent in preparing the dry-land plats for spring seeding. On April 11, the seeder was started on the wheat increase, 16 acres being seeded to Early Baart. Series "A" of the Tillage Experiments, containing twenty tenth-acre plats also was seeded to Early Baart wheat. Certain plots of series "B" of the tillage experiment were given their April plowing, of discing, according to the original plans.

The first plats in the Date-of-Seeding experiment were sown April 15, also the plats of spring wheat at the rates of 20,30,45, and 60 pounds per acre.

The weather is rather unsettled and on April 13 three inches of very wet snow fell, which measured .41 of an inch in the guage. This wasfollowed by the temperature dropping to 15 degrees above zero on the 14th but it did not seem to injure the winter wheat that had emerged a few days before.

Seeding is general in the vicinity of the station, some having completed the seeding of wheat. Sage rats are numerous in some sections and farmers are after them with poisoned wheat. Deposits of grasshopper eggs are showing up in a few sections.

Sherman County Branch Station, Moro, (D.E.Stephens)

Favorable weather for seeding operations prevailed during the whole month of April. Practically all farmers had finished sowing spring grains before the middle of the month. On the Station, all grains in the varietal, rotation, and tillage experiments were sown before April 1. In most cases good stands were secured.

The maximum temperature for the month was 72 degrees on the 30th; the lowest, 27° on the 12th. The total rainfall for the month was one inch and the total precipitation since Sept. 1, 1918, has been 10 inches. This is about one inch more than the normal in this period.

Sherman County Branch Station, Moro - Con.

Winter wheat in this vicinity is in excellent condition. Stands are unusually thick, with rank growth, and the wheat probably will suffer for moisture unless weather conditions are favorable for the next two months. Powdery mildew is present to a considerable degree in all early-sown winter wheat. This disease is unusual in this section and it is not known whether it will reduce yields.

On the Station there is a rather serious epidemic of stripe rust, some varieties of winter wheat in the varietal experiments having this disease on every plant. Prof. C. E. Owens of the Department of Pathology of O.A.C. and collaborator of this Office spent a couple of days on the Station and vicinity investigating this disease. He made careful estimates of the rust on the varieties of winter wheat and found that Jones Winter Fife Burbank "Superwheat", Kanred, and Beloglina showed the highest degree of infection, while Kharkof 1442-12 and Kharkov 5549 showed the slightest degree of infection. Mr. J. C. Bell is now inoculating all the nursery rows in the classification nursery with this rust with the view of determing the resistance to this rust of all the commercial wheat varieties of the United States. Prof. Owens was able to find only a trace of stripe rust in commercial fields of Turkey wheat in the vicinity of the Station. One field of "Superwheat" about three miles from the Station showed infection to a considerable degree. Very little stripe rust has been found here since 1915, when there was an abundance of it. It did not appear to do any damage during that season, but indications now are that some of the susceptible varieties this year will be injured.

WASHINGTON.

Adams Branch Experiment Station, Lind. (M. A. McCall) No report.

CALIFORNIA.

Plant Introduction Field Station, Chico (V.H.Florell)

(April 15) Favorable weather conditions prevail and cereal crops are growing rapidly. The barleys have begun heading generally. A few varieties are fully headed. Only a few varieties of wheat have begun to show heads. These are either Australian or South African varieties. Federation, C.I.No 4980, was earliest in this respect. The South African wheats and Prelude, C.I. No. 4323, in the classification nursery began heading within the last few days.

Oats are growing rapdily. Flax is growing slowly and apparently is suffering from lack of moisture.

One of the powdery mildews (Erysiphe graminis) has made its appearance in the wheat nursery and has caused a considerable number of varieties to lodge badly. Other varieties, although infected on the leaves and stem at the base of the culms, show no lodging. Commercial fields appear to be practically free from this disease. It has been observed in but one field and there the infection was not heavy.

Plant Introduction Field Station, Chico - Con.

Commercial fields of wheat and barley are in exceptionally good condition, according to wheat growers of long experience.

(April 30) A rain of .70 inches fell on April 25 which has greatly benefited all crops. A considerable portion of the wheat nursery lodged badly and also a small portion of the barley nursery. Wheat is beginning to head generally. With but few exceptions barleys are fully headed.

The work in wheat hybridization was begun on April 24 in the classification nursery. Several early varieties were pollinated on April 29 and 30. A number from which crosses are desired have not begun heading but they are developing rapidly and should be ready soon.

The sorghums in the environmental experiment were drilled on April 30.

Many spring sown commercial wheat and barley fields are in very poor condition on account of the drought following the heavy spring rains. The so-called "Napa Thistle", and Wild Mustard are especially abundant in some of these fields. Fall-sown grain on the other hand is in excellent condition.

Temperatures during the past week have been high and the heat has been oppressive. A maximum of 89 degrees was recorded on April 30.

Prof. W. W. Mackie, Professor of Agronomy, and Mr. A. C. Wilcox, both of the University of California and also representatives of this Office visited the Garden on April 22. They were particularly interested in the Rhyncosporium of barley and tookinfection notes on all varieties and selections. The infection is light to moderately heavy this year.

Mr. Richard Diener, of Kentfield, California, was a visitor on April 24. He inspected the strains of "Diener Wheat" sown in the classification nursery.

Mr. J. B. Norton of Washington, D.C. recently appointed agricultural explorer in the Office of Foreign Seed and Plant Introduction to succeed the late Mr. F. N. Meyer, was a visitor from April 27 to 30. He expects to sail for the Orient on May 5 to continue the work of exploration in China.

Rice Field Station, Biggs. (Jenkin W. Jones)

Field work began on the station April 3. Plowing, disking, harrowing, and floating were completed by April 18. Seeding started on April 17 and was finished, except for part of the nursery, on April 23.

The soil was extremely hard to work this spring. It plowed up rough and it was next to impossible to work it down to a good seed bed. However, we had a fairly good seed bed for most sowings.

Rice Field Station, Biggs - Con.

Water was turned into the canal about April 23, and we began irrigating on April 25, but only a small head was available until April 28. The fertilizer, cultural, and irrigation experiments have been irrigated.

The rice farmers are all busy preparing their land for seeding. Only a small percentage of them are using water at present, but many will soon be ready. About 1200 acres has been irrigated by the Sutter-Butte Canal Co. to date. Indications are that the planting and irrigating season will be about one week earlier than it was in 1918, and that was a late spring.

The weather has been quite cool but is warming up at present. The maximum temperature for April was 86 degrees on the 29th.

Labor is not too plentiful and wages for men, horses, and tractors are the same as they were a year ago.

The heavy snowfall in the mountains last winter should supply ample water for this crop year.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S.Dept. of Agriculture.
(NOT FOR PUBLICATION.)

-o-o-o-o-o-

Vol.11 June 10,1919 No. 9.
Field Station Issue.

NON-APPEARANCE OF CEREAL COURIER.

It is greatly regretted that the Cereal Courtier has not been issued regularly as planned. This has been due to a lack of time and clerical help. Stenographers are at a premium, the supply being unequal to the demand at the present time. It is hoped that this condition will be remedied within the next few weeks and that it will be possible to keep our large and increasing staff in the Office and Field informed about cereal activities with fair promptness.

FIELD STATION CONDITION AND PROGRESS.

HUMID EASTERN STATES (South to North.)

LOUISIANA.

Crowley Rice Station, Crowley. (J. Mitchell Jenkins.) Field work at the Station has been greatly delayed by rain which in the last week has been frequent, totaling 7 inches in 6 days. The seeding, however, has progressed rapidly under the conditions prevailing during May, which have been abnormal for the month. Nursery, increase and cultural plats have been seeded and a good stand obtained. The ground is still saturated but with good weather seeding should be completed within a few days.

GEORGIA.

State Experiment Station (Athens) and Substations. (R. R. Childs.)
May 16. Rainfall for April 2.84 inches. Good rains have fallen since May 1 and the conditions of wheat are much improved. As a whole the wheat crop is not so good as in 1918. A fair stand of oats survived the winter but the crop is very poor.

Barley and several varieties of oats are beginning to ripen and will be harvested in the next 10 days.

Plats of oats and wheat show a decided difference between Oct. 15 seedings and Nov. 15 seedings in favor of the early seeding.

Mr. Chas. E. Chamblis, Agronomist in Charge of Rice Investigations, was a visitor at the station on May 2 and 3.

TENNESSEE

State Experiment Station, Knoxville, (C.A.Mooers) No Report.

NORTH CAROLINA

State Experiment Station, West Raleigh. (G. M. Garren) In two or three weeks the wheat harvest will be in full swing in North Carolina. The acreage is unusually large and the present prospects are favorable for an average crop. To date the most unfavorable condition for the full development of the small grain crop of the State during the season was some slight winter-killing in the early part of the past winter. The past winter was one of unprecedented mildness and as is almost certain to occur during mild winters, there was some winter-killing. During the very last days of December and the first of January there was a cold snap that had been preceded by a season of unusually mild weather. There resulted a considerable winter-killing of the late sown grains in the western part of the State. The early sown came thru uninjured. As a large per cent of the crop had been seeded early, the damage to the crop of the State as a whole was not very great.

One feature of the small grain crop in the State the present season is of more than passing interest to those who are interested in seeing the small grains successfully grown thruout the entire state. There has been, under the stimulus of war-time conditions, a large acreage seeded to wheat in the coastal plains region of the State. This region is that portion of the State lying between the low foot hills of the eastern boundry of the upland sections and the Atlantic coast. The sandy types of soil prevail in this region. It is especially adapted to the growing of cotton, tobacco, and peanuts. For a long time the growing of wheat in this region had been abandoned for these other more profitable crops. For the past three or four years, after the price of flour had materially advanced, some desultory but successful efforts were made to grow wheat in the more favorable localities of this region. But on account of the lack of suitable machinery for harvesting and threshing the crop and of mills for converting the grain into flour, little headway had been made towards popularizing the growing of wheat as one of the general field crops in this region. With the hope of supplying home demands under war time conditions the farmers seeded a large acreage to wheat with the expectation of making the necessary preparations for handling the crop. If the present crop proves a success it will doubtless mean the reintroduction of wheat growing in this part of the State. The final results are awaited with anticipation by all who are interested in grain culture in North Carolina.

VIRGINIA.

Arlington Farm, Roslyn. (Henry P. Ames.) Frequent and heavy rains occurred throughout the month of May. However, practically no rain

fell during the last week. The total precipitation for the month was 6 inches; maximum temperature, 92 degrees on the 30th; minimum, 43 degrees on the 3rd.

The varieties of winter barley in both field and nursery plats are ripening rapidly and will be ready for harvest by the first week in June. The late varieties of winter oats are about fully headed. Fulghum and other early varieties are beginning to ripen. The winter oat crop on the farm as a whole is in good condition and if favorable weather continues some excellent yields will be obtained. The varieties of winter wheat in two of the three series of fortieth-acre plats have lodged badly as a result of the wet, cloudy weather which obtained during the first three weeks of May. In consequence, harvesting will be exceedingly difficult, yields will be decidedly reduced and the quality of grain impaired.

After the rainy weather ceased, leaf rust developed rapidly and to a very noticeable extent on both wheat and rye.

Spring sown field plats and nursery were hand-hoed on the 24th and 26th to remove weeds. Roguing of the field plats of winter wheat is in progress.

Dr. Kanji Sato, Assistant Professor of the Imperial University of Tokyo, Japan, was a visitor at the Farm on May 20 and manufested considerable interest in the cereal experiments. He was especially interested in varieties of winter barley.

Fifty casuals from Walter Reed General Army Hospital, visited the farm on May 21. Several showed much interest in the cereal work which was explained to them by representatives of the Office of Cereal Investigations.

NEW YORK

Cornell Experiment Station, Ithaca. (H.H.Love.) No Report.

MISSOURI

State Experiment Station, Columbia. (L. J. Stadler.) May 15. The first ten days of the month were cloudy and wet in Missouri and the weather conditions cool. The Missouri, Grand, and Mississippi rivers above St. Louis flooded the bottom lands last week but the flood waters are now receding. The wheat crop is still in excellent condition and is heading in the southern half of the State. Some lodging is reported. Oats are in moderate condition. The acreage of oats is less than that of last year, chiefly because of the increased acreage of winter wheat. Corn planting has been interrupted by frequent rains and wet ground, but is almost completed in the southern half of the state. Farm work is two weeks behind in the northern part of the State.

The small grain plots on the Experiment Farm at Columbia are still in excellent condition. Corn planting will probably be completed on the Experiment Field within a week.

May 31. The month of May was cloudy and cool, with abnormally heavy

rainfall. The wheat, however, is still in excellent condition in the state as a whole. Harvest will begin in about a week in the extreme southern part of the state. The condition of corn is slightly below normal all over the state except in the central and southwestern portions. Corn planting is not yet completed in the extreme North, and some replanting will have to be done in the east.

IOWA

State Experiment Station, Ames. (L. C. Burnett). Field work was resumed on May 9 for the first time since April 26, owing to continued rain. Field work has been continuous since that date although many fields were too wet to work until the middle of the month.

Oat experiments not completed on April 26 were abandoned for the season and the land used for experiments with barley, corn and soy beans.

Spring plowing was greatly delayed by the rains of April and early May. 50% of the corn in the vicinity was planted by May 18. 70% by May 25, and corn planting was completed by the end of the month when the early sown corn was up and ready for plowing. In general the stand is very good.

Spring sown small grain is looking exceptionally good. Winter wheat will start heading early in June. The growth is so rank that there is danger of lodging if the weather should turn wet. The first cutting of alfalfa will be made in early June,

GREAT PLAINS AREA (South to North).

TEXAS.

Amarillo cereal field station, Amarillo. (John F. Ross.) May 15. The weather has been quite cool with only a few warm days. There have been two or three small hailstorms within a few miles of the station doing considerable damage to small areas of wheat. On the evening of May 13 a small "twister" which was plainly seen from the station, did some damage between Folsom on the Santa Fe and Washburn on the Denver railroad. It is reported that hailstones weighing 5 and 6 pounds were found after this storm has passed. The area damaged was small.

The weather data for the last half of May is as follows: Maximum temperature 85 on the 31st; minimum 41 on the 21st; aver age hourly wind velocity 6.7 miles; precipitation .84 inch, and evaporation 2.847 inches. For the whole month the maximum and minimum temperatures are the same as for the last half; average hourly wind velocity 5.9 miles; precipitation 2.03 inches; and evaporation 5.026 inches.

That we had only about two thirds our average amount of rain in May it came in such a way that it kept us out of the field for several days; Rain fell on eight days and on three of these in sufficient amounts to hinder work in the fields for two or three days at a time.

May 15. Winter wheat and other small grains are klooking fine. One variety of wheat (Nebraska Hybrid No. 28) and Tennessee Winter barley on the station farm are pretty well headed. The other winter wheats as well as the spelt and emmers will head right soon. A little rust is making its appearance on the lower leaves of some of the wheats.

May 31. All winter grains not previously reported heading had begun heading by the last of the month. Also nearly all spring oats and several varieties of the spring wheats were heading at that time.

The leaf rust which made its appearance about the middle of the month became very bad by the end of the month and all varieties of wheat were effected more or less. The later planted varieties showing the most rust. Rye, barley, spelt, emmer and oats seem to have escaped rust, or nearly so.

Mr. L. F. Locke reported for duty on May 5, taking the place left vacant May 1 by Mr. L. N. Jensen in the work of the Office of Dry Land Agriculture at this station. Mr. Locke has been working with pink boll weevil in the southern part of the state for several months and has just recently transferred to the D.L.A. office.

Visitors at the station: Mr. E. F. Chilcott on the 7th, Mr. W. H. Nehrling, Field Assistant in the cereal disease survey on the 12th.

OKLAHOMA

Woodward Field Station, Woodward. (John B. Sieglinger.) The weather for the month has been cool and rainy and seeding has progressed slowly. We have had a few good growing days this month but they have been in the minority. Total precipitation has been 4.04 inches, well scattered. 1.83 inches fell on May 25.

The second date-of-seeding was made on April 30 and emerged to stands on May 12 and 13. Good stands were secured with the exceptions of Barchet Kaoliang and feterita, which failed to germinate well, due to the wet, cold condition of the soil.

The third date-of-seeding was made May 14. On May 15 the broomcorn varietal experiment was seeded. Of the 13 varieties or strains of broomcorn, 3 varieties were included for the first time. On May 16 the rate and spacing experiments with broomcorn were seeded, also the broomcorn nursery, a number of sorgo-broomcorn hybrids, and a number of rows for the date-of-harvesting experiment. All the broomcorns emerged to good stands in 10 days.

The third date-of-seeding plats, which were seeded on May 14 emerged to stands on May 22 and 23, broomcorn, Dwarf Milo, feterita, sumac, and Red amber emerged on the 22nd while the Sunrise and Dawn kafir, and Blackhull kaoling emerged on May 23. The fourth date-of-seeding plats were seeded today, May 31.

The sorghum varietal experiment was seeded on May 19 and emerged to stands in 7 and 8 days according to the variety. The sorghum rate and spacing experiments were seeded on May 21 and emerged to good stands in 6 days for the Dwark milo and 7 days for the Sunrise kafir.

Moles have cuased some trouble but we have been trapping them. The moles do not eat any of the seed but seem to enjoy burrowing in the row where the soil is packed and of course cause the soil to dry out and delay or injure germinating.

Mr. Rothgeb visited the Station on May 26 and expressed himself as being satisfied with the progress of the cereal project considering the season. Mr. Rothgeb and myself examined the leaf rust on plats of wheat and rye on the station and by comparing leaves with the scale for estimating rust found that the percent of rust on wheat varied from 65 to 100% and the rust on the rye varied from 10 to 25%.

KANSAS.

Kansas Agricultural Experiment Station, Manhattan (John H. Parker) Weather and Crops Conditions. The month of May has been rather cool and with frequent rains. During the latter part of the month, the wheat, both at the Agronomy Farm and the Agronomy Nursery, has lodged badly, which will make note-taking and harvesting much more difficult. The total rainfall for the month was 3.18 inches; maximum temperature 87°, and minimum temperature 38 °. There was practically no winter-killing. Leaf rust has also developed in considerable quantity on both soft and hard varieties of winter wheat except Kanred which shows marked resistance. Powdery mildew also is present on some of the seedings which is unucual in this locality.

All of the wheat varieties are in full head except a few of the very latest ones, such as Odessa and Buffum. Barley is headed and early oats. Kansas No. 5179, known as Nicholson's Extra Early Red Rust Proof, has headed this year ahead of Kherson and Sixty Day and as early as the earliest strains of Burt and gives promise of making its usual high yield. Aurora, C. I. No. 831 is beginning to head. Flax is in bloom.

Conditions of the wheat crop over the State are the best for several years, with the biggest acreage ever known and every indication of the biggest yield ever obtained. There is beginning to be serious complaint of too much rain and of serious trouble from lodging and some loss from leaf rust if wet weather continues.

Cereal Experiments.

Cereal Experiments in the Agronomy Nursery for the year includes the following sowings:

A. Winter Wheat.

270 varieties and strains of winter wheat in rod rows replicated nine times.

250 single rod rows of winter wheat varieties and strains.

700 head rows of winter wheat.

About 240 eight-foot rows of wheat hybrids.

About 40 plants of F1 wheat hybrids.

B. Spring Grain Nursery

About 50 short rows of wheat varieties and small plots of Prelude, Marquis, and Preston. Prelude is in full head.

About 70 varieties and strains of oats in rod rows replicated nine times.

About 85 varieties and strains of oats in single rod rows.

About 700 head rows of oats, seed of which was inoculated with smut.

About 60 rod rows of oat varieties, seed of which was inoculated with smut.

The two latter plantings are in cooperation with Professor L. E. Melchers and are for the purpose of studying smut resistance of various varieties and pure lines of oats.

The Rust Nursery maintained by the Botany Department includes the standard row-row seedings in the biologic form experiment and about 200 four-foot rows of winter wheat varieties and the same number of spring wheat varieties being tested for rust resistance.

There are about 25 varieties and strains of barley in the rod rows replicated nine times and about 30 short rows of hybrids between Nepal and Gatami barley received from H. S. McFadden of Highmore, South Dakota. There are 15 varieties or strains of flax being grown in rod rows replicated three times and about 30 varieties or strains of flax in single rod rows.

In addition to these sowings in the Crop Improvement Nursery, Professor Salmon has an extensive series; one according to the usual method of surface sowing, and the other sown in furrows placed from four to fourteen inches apart and at the rates of two to eicht pecks; and a series of plats for the purpose of studying the effedt of fertilizer on the yellow berry content of three different wheat varieties.

In the round crops nursery, there are about 300 head rows of sorghums, including duplicates of the series sown at the Hays, Colby, Tribune and Garden City substations. There are about 360 ear-to-row experiments with corn. These for the most part are of various types of color or other kernel characters from hybrids grown last year. They include about 95 ears of Kansas Sunflower being tested for smut resistance.

There are 95 head rows of Sudan Grass sown for the purpose of observing any possible variation in leafiness, character of stalks, seed production, etc.

In addition to the corn mentioned above, Professor Melchers, in cooperation with J. R. Holbert, has an extensive series of ear-to-row plantings of Commercial White Dent corn in which resistance to Fusarium rots as well as smut is being studied.

Mr. John H. Martin, Assistant in Western Wheat Investigations, spent two weeks at this Station in making crosses between Kanred and other winter -hardy varieties. He left for Amarillo, Texas and Chico, California on June 1.

Mr. A. F. Swanson, who graduates this year, will leave for Hays June 5 to take up the cereal experiments at that station.

Fort Hays Branch Station, Hays. (Robert H Getty, Forage Crop Investigations.)

On Friday evening May 2, a torrential rain of 4.53 inches fell here, accompanied by quite destructive hail. The storm was quite local, only 2 or 3 miles wide and followed Big Creek valley about 15 miles. The wheat plots were hurt badly, in appearance at least. The hail was not so severe at the Dry Land Agriculture project, and it did not affect the station's commercial wheat fields much because these fields were south of the areas worst hit. All the station's 300 acres of alfalfa, and such wheat as lay on the bottomland was thoroughly cut down. It is impossible for us to guess what the final damage to any of the wheat will be. That on the cereal plots was 12 to 18 inches high, ranker than usual, and jointing some.

During the four days from May 21 to 24, it was finally dry enough to get into certain fields that had been too wet to work since April 22.

Blank listing preparatory to planting corn and sorghums was completed May 24 on the forage and cereal plots, and plowing is being done on the bind-weed project today, 16 plots of grain sorghum were put in for the cereal office on May 21 and 24.

Wheat prospects around the locality are good. First heads are just out but only medium to poor on the cereal plots because of the hail. Growth of spring grain continues excellent.

Mr. B. E. Rothgeb of the Cereal Office spent May 22-24 at the station.

COLORADO

Akron Experiment Farm, Akron. (F. A. Coffman.) May 15. Low temperatures for this late in the spring, prevailed at Akron, during the first half of May. Considerable moisture received and all crops in excellent condition at the present time. Winter rye has started to head and winter wheat is in the shooting stage. Spring wheat, barley and rye are growing well on the farms surrounding the station. Very little oats are raised in a commercial way in north eastern Colorado, since both spring wheat and oats are more valuable crops.

Corn planting is well under way. Most of the corn is being listed since that is the customary way to plant corn in this locality. Corn planting is at present occupying the time of the station employees. Most of the corn of t Office of Dry-Land Agriculture hasbeen planted. Ears for a row experiment of 76 ears have been prepared. This experiment will be conducted on Series V A., land which is to be used for seeding the cornstubble plats of the Cereal Investigations Office, in 1919-20. This experiment is partly a continuation of the work conducted with corn last season.

Plats of Nepal barley (C.I.No.595), Nohano Waso barley (C.I.No.754)

and Galgalos wheat C. I. No. 5398, produced poor stands and it was necessary to replant one-half of each of all the plats of Nepal barley and Galgalos wheat, and one of the four plats of Nokano Waso barley. The reseedings in the various plats have emerged. All of the Cereal Investigations grain is growing well.

May 31. For the week prior to May 31, it looked as though our annual drought had arrived at Akron Field Station. Up until May 31 only 1.04 inches of precipitation had been received during the month and no rain heavy enough to be of value, fell during the period May 8 to May 30 inclusive. Cereal crops in many parts of the eastern part of Colorado were seriously damaged by the dry spell. Burning was more especially noticable on fields poorly prepared for seeding, or in which the stands were too thick. Very little oats is sown in this locality since spring wheat and barley are better paying crops. The oats on the Cereal Investigations projects had started to show the effects of the dry weather nearly a week before the rain of May 31. With a total precipitation of nearly one inch from May 31 to June 2 accompanied by low temperatures, it is hoped that the ill effects of the drought will be largely overcome and that our spring cereals will yet produce fair yields.

Winter rye was fully headed and in blossom May 31. In several increase plats of Kanred (C.I.No. 5146), winter wheat, first heads appeared May 31. Many of the earlier-maturing spring barley varieties are in the boot and will be headed within the next week. Prelude C. I. No. 4323, spring wheat will soon be in the boot.

In the experiments with grain sorghums, proso, millets, buchwheat and corn, a total of 103 plats and rows were sown.

The maximum temperature recorded at Akron Field Station, during May was 89 F. on May 30, while the minimum of 33 was recorded May 3. The total precipitation for the month was 1.59 inches, or about one-half the 15 year normal for May at this station. Frosts have occurred both June 1 and June 2. Slight damage seems to have been done.

WYOMING.

Cheyenne Experiment Farm, Archer, (A. L. Nelson) May 15. The weather has been unusually dry and cool with low wind velocity. With only .58 of an inch of precipitation in April and .31 of an inch thus far in May, grazing conditions have become serious. The minimum temperature was 24 degrees and the maximum 78 degrees. However, the first ten days of the month were very cool. Seedings of May 1 made very little progress but good stands have been secured. Winter wheat, which has made a rank growth, is beginning to show the effects of dry weather.

The plowing of sod land has been discontinued, due to dry weather, and the farmers are in the midst of seeding spring small grains. Stubble land, which is to be seeded to corn, millet or oats for hay, is being plowed. There is still some plowing to be done at the Station.

Dean Faville and Director Quayle were visitors on May 14 and the needs of the station were considered.

Sheridan Field Station, Sheridan. (Leroy D. Willey) May 15. With the exception of a few dates of seeding, the spring sown winter wheat varieties came through the winter in very good shape. In the Varietal field there was no winter killing whatever, but in the rate and date of seeding field, the August 1 seeding killed about 50 per cent and the August 15the seeding killed around 5 per cent. Winter wheat is advanced in growth close to three weeks over this date last year, standing close to 8 inches high, without streightening a leaf. It is about all in the 5th and 6th leaf, and about to joint.

Winter rye which had volunteered was found in full head on the 12th, but the planted fields were about half way up in the boot. In 1917 winter rye headed on June 12 while in 1918 it headed on the 6th of June.

All spring seeded crops came up with a good stand with one or two exceptions. Planting of wheat and oats was done in March, while barley was not planted until April 15. All of these crops are making a normal growth. A very severe wind storm, on the 13th, caused considerable soil movement, (an unusual thing here), and some damage was dome to the rate and date of seeding plats of wheat, oats and barley, and more especially to those dates of seed which has jjustt come up. However, no injury was done, from which crops will not recover.

While there seems to be sufficient moisture in the soil to last growing crops until the first week in June, or later, we are short of rainfall On May 1, there was a shortage of 2.98 inches from the first of the year, and we are close to 3.50 inches short of normal today. The public are growing very pessimistic about the crop prospect for this year, and especially those on irrigsted land, for there is only at this date, from 1/3 to 1/2 the normal amount of snow in the mountains.

Labor is very short around Sheridan, but with the very little adverse weather for field work, which we have had thisspring, has made it possible to do an immense amount of work with a small number of men. Considerable new land was put into wheat this spring.

May 31 . The past week has been unusually hot for the month of May, temperatures of 95 and 96 having been recorded on the 28th and 29th. No temperature above 91° has ever been recorded in May at Sheridan in the 26 years of records.

None of the plats on the Cereal field have been hurt seriously. All winter wheat plats have brrned slightly about the base of the plants and they have made a rapid growth, the varietal plots having burned worse than rates and dates. Sufficient rai n from now on will isure us a good crop.

Spring crops, that is, wheat, oats and barley, have only tip burned and that very little. Flax sown on the 14th is up with very uneven stands, due to the very dry condition of the ground. Rain which amounted to .24 inches on the 29th, however, will correct this unevenness, if it is followed by more rain.

SOUTH DAKOTA.

Belle Fourche Experiment Farm, Newell. (A. D. Ellison.)
Cottonwood Substation. (Manley Champlin.)
Highmore Substation. (E. S. McFadden.)
Eureka Substation. (Manley Champlin.)
Brookings. (Manley Champlin.)

Newell. May 13. Practically all cereals sown in the various experiments, both on dry and irrigated, have emerged and are making good growth. (Mr. Ellison has been in the Southwest since the above was written, supervising the harvesting of flax sown commercially, last spring.)

Cottonwood. Seeding is about complete. Moisture conditions are favorable to date.

Highmore. May 15. The sowing of small grains on the Highmore station was completed early this month with the exception of some low land which could not be put in on account of high water.

A severe frost occurred on the night of April 23rd when the mercury dropped to 19 degrees above zero. The barley nursery was badly frozen back with the exception of one selection ofhull-less barley, a hybrid between Gatami and Nepal, which was practically uninjured.

A hail storm in the morning of May 3 beat the small grain into the ground quite badly and set it back several days. Over two inches of rain came in the same storn with the hail, and in the long run it is probable that the rain will do more good than the hail did damage. We have had 3.70 inches of precipitation since May 1 and crops are in excellent condition at present.

Winter Wheat and rye came through the winter in excellent condition, and both are well jo9nted at present.

May 31. A big rain on the afternoon and night of May 30 put crops in this locality in excellent condition. A total precipitation of 6.63 inches for the month of May gives prospects of bumper crops where grain was sown early.

Winter rye is fully headed and has reached the flowering stage on early sowed plats. Winter wheat , with favorable weather conditions, will start heading in a few days.

Several awnless barley selections in the nursery are well jointed and will probably be headed within a week or ten days. These are hybrids between Arlington Awnless and the leading bearded varieties grown in South Dakota. Due to their earliness they give promise of value in evading the drought and hot winds of early summer. Several og these selections (mostly hybrids between Oderbrucker and Arlington Awnless) outyielded the best bearded varieties grown in the nursery last year.

Corn and early planted potatoes have been up on the station for about a week. The new growth of alfalfa is starting, and the first cutting will be made sometime this week if weather permits! Pastures are in excellent condition and range cattle are looking good.

Eureka. All cereal seedings were completed on time and spring grains have invariably produced excellent stands. Fall seeded grains, both winter and spring have failed to survive. Since volunteer grain has started as usual in the neighborhood, we believe that the reason for the loss of the fall seeded spring grains is shallow seeding, the grains having been put in on corn stubble without preparation other than the cultivation of the corn. We hope to correct this condition by removing the corn stalks and double disking the stubble thoroughly and seeding as deep as possible. The object of late fall seeding spring grain is to gain the advantage of early spring seeding for as large an acreage as possible, as we have found in the date of seeding experiments that seeding on time is the biggest factor in increasing crop yields.

Vivian. All the spring seeding is complete including flax and grass seeding on old pasture land. Conditions at this time are unusually favorable from the standpoint of moisture, and farm work in the vicinity is well advanced. An 8-16 H. P. tractor is being used for most of the plowing and belt work at this station. Increase plats of Acme wheat, Odessa barley, Sixty Day oats and Swedish rye are being grown.

Brookings. All cereal crops are sown at this time, including flax. For the most part they were sown on time, except certain rotation plats in durum wheat. The seed for these plats was treated at the University of Wisconsin by the dry heat process in the hope of eliminating scab and similar diseases and with the object of studying the effect of rotation in the control of such diseases. Small grain survived in good condition. Winter rye seeded September 1 is nearly headed out at this time.

General. Except for the fact that many of the fields throughout the state were seeded late on account of wet weather during April, crop prospects are good at this time. Winter rye is very promising, some of the earlier-seeded fields being headed or nearly ready to head at this date. Tields of spring grains may be reduced on account of the general average of late seeding. No evidence of "take all" or other cereal diseases has thus far been reported in cereals. The bacterial disease causing crown rot of alfalfahas been reported, but is not as prevalent this year as it was in 1918.

NORTH DAKOTA.

State Experiment Station, Agricultural College. (Theodore Stoa). May 31. All seeding about completed in this locality. A good rain came May 30 and will aid in starting the late seeded grain. In the northern part of the state some late grains are yet to be seeded, especially barley and flax, the acreages of these being increased beyond early expectations on account of much rain during early May. The grasshopper problem is again serious in the western portions of the state.

Rainfall as recorded for this locality May 16 to May 31- .92 inches.

Maximum temperature occurred on May 30 when 94 degrees was recorded. This was accompanied by a hot wind. Minimum temperature during this period was 40 degrees.

May 15. Persistent rains have badly delayed seeding operations in this locality during the past two weeks. Though practically all the wheat was seeded in this vicinity before these rains, it is estimated that only about 40 to 50 per cent of the wheat has been seeded in the more northern parts of the state. The effect, no doubt, will be a smaller wheat acreage and an increased area of other crops, especially flax. An emergency seed list is being compiled in order to enable us more efficiently to answer the calls for such seed.

The total precipitation from May 1 to May 15 was 2.87 inches. The maximum temperature was reached May 11 when the thermometer registered 72 degrees. The lowest temperature (30°) for this period occurred May 1 and 5.

Northern Great Plains Field Station, Mandan. (J.C.Brinsmade, Jr.)
May 15. The weather during the first half of May has been unusually cold and rainy for this time of year. Maximum temperature was 74°, recorded May 11; minimum 29° recorded May 5 and 7; precipitation 3.48 inches. Except for a snow storm on the night of May 5, all of the precipitation came in the form of slow drizzling rains, practically all of which soaked in.

Sowing of the wheat nursery was postponed until May 5 on account of rain. The third date of seeding was sown May 15.

In spite of the abundant rainfall, grains have been slow in emerging doubtless due to the continued cold. The wheat varieties sown April 25 and oats sown April 26 emerged May 12. Flax and grains sown in Mr. Reddy's experiment emerged May 13. Barley varieties sown April 30 emerged May 14. Flax sown May 1 and the wheat nursery sown May 5 emerged May 15.

It is now planned to postpone the regular flax seedings until May 22 or 23.

Mr. A. F. Thiel was here May 12 sowing an experiment for the study of rust on wheat, oats, barley and rye.

May 31. The last half of May has been generally warm and mild with very little wind or rain. Precipitation for the last half of May amounted to only .47 inch. Maximum temperature for the month of May was 93° recorded May 28; minimum for the last half of May was 40° recorded May 20.

Small grains and the first three dates of seeding with flax are growing well and the regular flax plat plantings seem to be emerging satisfactorily. The flax in the D.L.A. continuous cropping plats failed to show up in spots, and seems to have been nipped off close to the ground, due either to a disease or an insect or possibly to frost as the minimum thermometer registered 33° this morning (June 2.)

The regular flax varietal plats, rate-of-seeding experiment, etc.

were not sown until May 26 and 27, and nursery sowings were just begun today.

Mr. C. M. Woodworth, in charge of flax breeding for disease resistance, arrived here May 21 from Madison, Wisconsin and after putting in some flax left again May 24.

Dickinson Substation (Ralph W Smith) During the first half of May there was an abundance of moisture, the precipitation totaling about 2.3 inches. This resulted in even germination and uniform stands of nearly all cereal crops. During the latter half of the month the weather has been clear and hot with only light showers. During this time germination and growth have been very rapid so that spring sown cereal crops are about 6 inches high and winter rye is heading. The maximum temperature for the month was 96 degrees, May 28. On May 29 there was a violent wind that probably caused some damage in the vicinity by soil blowing. This was followed by a sudden drop in the temperature, so that there is possibility of frost.

Winter grain came through the winter better than usual, the winter wheat suffering less from winterkilling than from grasshopper injury last fall. A plat of winter wheat and one of spring rye were sown last fall and had just begun to germinate when winter set in but did not emerge till about the middle of April. The stand is thin but better than expected. Winter rye is in fine condition. About 500 nursery rows of winter wheat came through the winter with fairly good stands except where thinned out by grasshoppers last fall.

The spring nursery contains about 800 red rows of wheat and about 260 of oats and barley. There are about 500 five feet rows of wheat including the classification nursery of durum varieties and there are 50 selections of Monad in 8 foot rows. All of the nursery has emerged or is emerging except the head rows and the last seeding of the rust nursery.

All cereal crops have emerged with fairly good stands. Stand notes have been taken on practically all varieties in plats and nursery. The nursery is being cultivated and the alleys between plats will be cultivated in the near future.

The hot weather caused grasshoppers to hatch out in large numbers in certain spots on the Substation and throughout this section of the state. The County Agent and Farm Bureau are cooperating in an extensive poisoning campaign and it is hoped to keep the hoppers under control. Poisoning was begun at the Substation May 23. Some slight damage has been done by them but they are thinning out where poisoned, and the application of poison are repeated at frequent intervals.

The Substation was visited during the week by Director Trowbridge and Prof. Walster of the State experiment Station. Supt. Stephens of the Mandan Station and Mr. Cockwood, grasshopper expert from the U. S. Department of Agriculture.

MONTANA.

Judith Basin Substation, Moccasin. (P. V. Cardon) No Report.

WESTERN BASIN AND COAST AREAS (South to North and West).

UTAH.

Nephi Substation, Nephi (Aaron F. Bracken.) During the month of May..95 inches of precipitation fell in five showers .04 on May 6, .04 May 10. .10 May 11. .30 May 23 and .47 inches May 30. The maximum temperature of 88° occurred on May 21, 22 and 28; and the minimum temperature of 26° occurred on May 6. The greatest amount of wind for a period of twenty-four hours was 6.3 miler per hour on May 30 and the average daily velocity for the month was 3.6 miles.

Before the last two storms of.30 inches on May 23, and .47 inches May 30, the grain in this section was suffering for want of moisture and the wheat in a few fields began to burn, but now good yields are almost sure.

Considering the crops on the station, this year could not be better for experimental work. All experiments wity variation in soil preparation, method of cropping, method of add ng fertility, and in rates of seeding show marked differences.

The spring seeding on the station was finished before May 15. Since this date the roads and alleys have been cleaned; the corn, potato, and pea plots have been hoed, and all fall plowed plots have been weeded.

IDAHO.

Aberdeen Substation, Aberdeen. (L. C. Aicher.) No Report.

OREGON.

Harney Branch Station, Burns. (Obil Shattuck.) May 19. The seeding on the station is practically complete with the exception of a few plats in the Irrigation series.

The first 15 days of May have been quite windy and as a result the crops are all in need of moisture. There has been np precipitation since the 18th of April.

On May 6, Messrs. Jamison and Thompson of the U. S. Biological Survey, visited the Station to duscuss the sage-rat and grasshopper problem. The county court of Harney Co. is furnishing a limited amount of poisoned oats and poisoned bran mash to the farmers gratis, with the result that these two pests are being poisoned generally. The grasshoppers are hatching rapidly due to the warmer weather of the past week.

Mr. Alva Breithaupt arrived at the station from Corvallis early in May to act in the capacity of Irrigation Assistant during the summer.

May 31. The latter part of the month was spent in finishing up the seeding, irrigating and preparing several plots for irrigation.

On May 25 the dry spell was broken by several light showers totaling .07

inches. This was followed by .23 inches on May 28. On May 30 and 31 and June 1 the thermometer registered 23, 18 and 21° respectively. The only crop on the station that was not injured to any extent was the spring rye on the increase and rates and dates. This variety was C. I. 26101.

The alfalfa was frozen more than half way to the ground and is being harvested as fast as possible. The spring wheat and barley varieties on the dryland were injured, most with the oats a close third. The winter varieties of wheat and rye were just coming out of the boot and are practically cleaned out. On the irrigated plots the injury was not nearly so heavy with the cereals as the forage crops. The alfalfa and peas suffered the most. The root crops had not emerged so were not injured and are coming well at present. Cabbage plants were killed in a well covered hit bed. All of the fruit and berries near Burns were killed.

The leaves on most of the shrubbery were injured to some extent with the exception of the native wild roses and currants. The white clover on the lawn was frozen.

The grasshoppers arrived at the station May 26 and we have been right after them ever since, with the result that they have not made much headway and the dead ones are showing up. They are still very small although several full grown ones with wings have been noticed. The farmers generally are putting out poison but a few are not taking advantage of the free poison and as a result they have lost their entire crop.

I have not been able to determine the exact amount of damage resulting from the frost but it is rapidly showing up and I will know in a few days.

The total precipitation for the month of May was .32 of an inch. The maximum temperature was 93 on the 28 and 18 on the 31.

Sherman County Branch Station, Moro. (D. F Stephens.) During most of the month of May the weather was cold, dry and windy. The total precipitation for the month was only .18 inch. The normal for the month of May is 1.25 inches. The highest temperature was 87 degrees on the 21st and the lowest 30 degrees on the 3rd.

Rain is badly needed throughout the whole Columbia Basin of Oregon. A great deal of winter wheat on the shallow soils is now burned beyond recovery. On the deeper soils winter wheat is not yet injured, but light yields will probably be obtained unless weather conditions during the next two weeks are favorable. Winter wheat throughout most of the County is now heading.

On the station the first wheat to head was Nebraska Hybrid No. 28. This variety was fully headed on May 26. The Crimean varieties are now nearly fully headed. Mariout, Beldi, and Himalya spring barleys are about fifty per cent headed and Hard Federation spring wheat is beginning to head.

Dr. A. G. Johnson, Prof. C. E. Owens, Prof. C. W. Hungerford, and Mr. J. C. Bell were recent visitors at the Station in the interests of stripe rust investigations.

WASHINGTON.

Adams Branch Experiment Station, Lind. (M. A. McCall.) We are planning on a Farmers' Field Day, on the station this coming month. It will be our first, if we succeed in puttint it across. In some respects, conditions are not all that might be desired, but I feel that we have several very good demonstrations well worth the farmers' attention.

Crop prospects are somewhat below normal this year but are enough better than those of last year to be encouraging, and the general physical condition of the station is excellent.

Winter varieties are heading and some of the early spring varieties are also beginning to head. Field peas are also in blossom.

Our cereal nursery this year, is not doing as well as might be desired. Apparently this is due in part to the physical condition of the soil. In going to and from work, when the general field was plowed, this particular ground was tramped more than the average. Later cultivation removed the evidence of this and it did not occur to me in locating this year's nursery on that particular spot that conditions there were any other than normal. This is the first year we have used this particular tract fir nursery purposes, it being a part of our permanent nursery block, on which we were following the three year rotation, peas, fallow and nursery.

Wire worms have again proven very destructive in the cereal nursery and until a control system can be perfected, it is doubtful whether breeding work and kindred investigations can be very successfully carried on.

CALIFORNIA.

Plant Introduction Field Station, Chico. (V. H. Florell.) May 15.

The barleys and wheats are producing a heavy growth of straw. The wheats especially are growing very tall. A number of varieties in the nursery stand nearly six feet high. There is comparatively little lodging in the field plats but the Australian and miscellaneous wheat varieties in the nursery are lodged badly. Here, however, early lodging was induced by the infection of common powdery mildew, Erysiphe graminis. About two hundred rows of the barley nursery have gone down badly.

Nearly all varieties of wheat are fully headed/ A large number of the barleys have begun to ripen and several varieties in the nursery are fully ripe. Oats are making a heavy growth this season and most carieties are fully headed. Flax is in bloom and the earliest varieties are beginning to boll.

The crossing of wheats will be completed within a few days. Only the late-heading varieties remain to be worked. Over one hundred heads have been pollinated at this writing.

Commercial grain fields have improved appreciably since the rain of last month. Both barley and wheat are filling well.

Dr. Charles Drechsler, formerly in Cereal Disease Investigations of this Office, has been visiting the Garden for several days and will leave shortly for points in Oregon and Washington.

May 30. There has been considrable north wind during the past week with a strong norther blowing today which is causing small grains to ripen rapidly. All barleys are ripe with the exception of two or three nursery varieties. Head selections of the barley have been collected. A few varieties of wheat are all ripe while a considerable number have begun to ripen. Herbarium specimens of the unclassified wheats in the Classification Nursery have been gathered. A number of varieties of oats are ripe while all but the two or three varieties of winter oats have begun to ripen. Most flax varieties are fully bolled but none have begun to ripen.

Notes on leaf rust of wheat were taken during the past week on all varieties. The Australian wheats are most severely infected, sometimes running as high as sixty five to one hundred per cent. In the Classification Nursery high resistance in the common wheats is found in a number of cases. Only slight traces of what was thought to be stem rust was found. A low percentage of loose smut of wheat was observed occasionally, but in comparatively few instances. Covered smut of wheat was not observed in the nurseries but some infection has been found in the field plats where it is believed to be light except on one or two varieties.

The barley harvest will be begun the first thing next week.

Commercial grain fields are showing up well. According to reports a few combines have begun the barley harvest.

Rice Field Station, Biggs. (Jenkin W. Jones) The station rice has been irrigated four times, once in April and three times during May. Stands on the plats are reasonably good, but the nursery stands are thin, especially the spaced plantings.

Irrigation and drainage ditches have been cleaned during the month.

Four rows each of five varieties of cotton were planted May 7 and irrigated May 8. The stands obtained are fairly good.

Six varieties of sorghums were sown May 7 and irrigated May 11. The stands for some varieties are good, while others are very poor.

Most of the rice in this vicinity has been sown and irrigated. However, there are some still preparing land and many are irrigating the first time.

Water seems to be plentiful, and water-grasses are abundant. Many fields well prepared and sown to rice, after the first irrigation, are now as green as a lawn and fully three fourths of the plants are water-grass.

In general the weather has been favorable for work and plant growth. The maximum temperature for May was 99 degrees.

117

JUL 31 1919
BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U.S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

ooo ooo

Vol. 11. July 10, 1919, No. 10
Field Station Issue.

BY WAY OF ENCOURAGEMENT

Getting out the news is still being subordinated to getting the work done, hence this single report for all of June. The semi-monthly reports are very good and in July two field station issues of the Courier are promised. Let's have the July 15 reports promptly, therefore, especially from the Eastern stations, which go to press first.

A personnel issue, about July 20, will bring you into touch with the many changes which have taken place in our big force in office, field, and station positions.

FIELD STATION CONDITION AND PROGRESS.

HUMID EASTERN STATES (South to North).

LOUISIANA

Crowley Rice Station, Crowley. (J. Mitchell Jenkins.) June 1 to 15. The greatest precipitation in 24 hours was .52 inches , on June 10. The total in the half month was 1.44 inches. This precipitation, as recorded, took place on eight days. These showers, following the heavy precipitation of May, caused much delay. Stands are poor in some instances, where seeding took place before flooding rains in May. This is especially true in case of deep-seeded plats, and uneven seed-bed.

GEORGIA

State Experiment Station (Athens) and Substations. (R. R. Childs.)

June 16. All of the small grains at this place have been harvested, and we expect to begin threshing in a few days. The yields of wheat promise to be very good. They were all harvested with practically no rain on them, and a good quality of grain as expected. The oats were rather short, and the yield will be somewhat low. Barleys were also very short and did not seem to make the proper growth in the spring.

, All varieties at the Tifton Substation have been harvested and threshing probably will begin there in a few days.

TENNESSEE

State Experiment Station, Knoxville. (C. A. Mooers) No Report.

NORTH CAROLINA

State Experiment Station, West Raleigh. (G. M. Garren). June 28. One of the forward steps in the developement of a greater interest in the growing of the small grains in North Carolina will doubtless be interesting to the small grain growers in other States. At the entrance of the United States into the world war, according to statistics compiled and published throughout the State by the Commissioner of Agriculture, North Carolina had produced enough wheat to meet the home demands for flour. As soon as a war time food commissioner was appointed, he immediately stopped the importation of wheat. The millers, operating within the State, raised the cry that the statistics were all wrong, that they were dependent upon large importations of wheat for supplying the home demand for flour. "If the prohibition of the importation of wheat is not at once removed", they said, "we will be compelled to close our mills." The food commissioner and the mills appealed their case to the Commissioner of Agriculture. He simply cited them to the statistics, declaring they were correct; for he was only quoting the figures collected by the U.S. Department of Agriculture. By this time the stock of flour in the hands of the merchants of the State had diminished almost to the vanishing point and it was evident to every one that unless something wa s done at once the consumption of wheat flour in North Carolina would be greatly limited for the duration of the war. The people now became alarmed and raised the cry that they were the innocent by-standers who had been hit a terrible blow with this statistical cudgel. As Southern people, they were fond of their corn pone but were unwilling to acknowledge that it alone constituted the staff of life. The controversy was finally settled by the food commissioner relenting and allowing a limited importation of wheat.

The Commissioner of Agriculture refused to recede from his position on the correctness of the statistics. So thoroughly convinced of their correctness was he, that he evolved a scheme for checking them. At his request the legislature, while in session last winter, enacted a law requiring all operators of thrashing machines in the State to take out license to operate and at the end of the season to report the actual number of bushels of grain thrashed. The law is simple in its execution, and if rigidly enforced, the actual number of bushels of wheat, rye, and oats grown in the State will be definitely determined. The law was modeled on the cotton ginners' law that requires all cotton ginners to report the number of bales ginned.

The reports are to be made on blanks furnished by the State Department of Agriculture. These blanks call for the number of acres upon which the grains were grown. This is a feature not embodied in the law and is the weak point in accomplishing the purpose for which the law was enacted. A thrasher in this State is paid for his services in a toll of so many bushels per hundred of the actual number of bushels thrashed. Hence the measuring is done at the machine under the watchful eye of both the grower and the operator of the machine. There is no reason, if the reports are correctly made out, why the actual number of bushels of small grain grown in the State cannot be definitely determined. But the operator of a thrashing machine has no means of finding out the number of acres upon which the grain was grown except by inquiring of the farmers. He may, for various causes, neglect to inquire.

In a large number of cases, the farmers do not know, except as they guess at it - no actual measurement ever having been made.. However, this scheme may prove the best means of getting an estimate of the number of acres seeded to the small grains in the State.

VIRGINIA

Arlington Farm, Roslyn. (Henry P. Ames.) The weather conditions at the farm have been fair with occasional storms and one or two rainy days during the month. The maximum temperature was 94 degrees on the 3rd; minimum 49 degrees on the 30th. The rain storms which generally followed the hottest days, gave a total precipitation of 2.95 inches.

The harvest of practically all of the cereal crops, both nursery and field plats, was completed by the end of the month. It appears that leaf rust has done considerable injury to the grain yields of the varieties of wheat and rye. Two series of the wheat varietal experiments have been almost ruined by lodging and wet weather which retarded harvest. Nearly all of the oats, both plats and nursery, were harvested in excellent condition. Thrashing will begin early in July.

NEW YORK

Cornell Experiment Station, Ithaca. (H. H. Love.) May 31. Owing to a very wet April and early May, it was not possible to finish seeding oats and barley until well after the middle of the month. The result has been that many farmers have not put in nearly the amount of small grain that they usually sow and will either grow corn or possibly more buckwheat. Some sowing, particularly in the northern section, has been done as late as the latter part of May and some of our experimental plats the first two or three days of June.

We have thirty-six different sorts tested in rod rows, repeated ten times, in three different counties. These were sown unfortunately at quite different dates, but nevertheless, will give us some valuable information as to the comparison between yields of the early and late sown strains. Our rye plats are headed, and wheat is heading out. In general, wheat on the experimental plats as well as in the surrounding country looks well, but owing to the incessant early rain and several days of hot dry weather, some fields are beginning to suffer from the packed condition of the soil and lack of moisture. Wheat hybrids grown in the greenhouse are being harvested. The Club Spelt hybrids are furnishing some very interesting types. Another lot of interesting material is that harvested from the Marquani-Early Red Chief cross which has shown the synthetic wild type and also the type with the reversed awns.

June 30. The month has been rather dry and hence has hastened the ripening of wheat and rye. Indications are that rye harvest will begin probably by the 10th of of July and wheat harvest shortly after. Most of the wheat in the central part of the State looks very well in spite of the dry weather. The fields are spotted somewhat, yet indications are for a very good crop. So far the grain stands well and only in few places has there been indications of lodging. There seems to be considerable rust developing in certain sections.

In our nursery here at Ithaca wheat is turning rapidly and harvest will begin about the 7th of July. Some very promising strains are observed among the new wheat selections and wheat hybrids. In the nursery of hybrids, some very promising beardless emmers and beardless spelts have been obtained as well as some very promising wheat types from a wheat-emmer cross. In the series of plats this year we have growing for the first time the new hybrid from the Ontario Agricultural College, O. A. C. 104, and it is looking very well at this time. The harvest of wheat and oat hybrids in the green house has been completed and many important crosses have been made and plenty of first generation material from a number of these is available.

The dry weather of June is injuring the oat crop, particularly as the oats were sown so late. The oats are heading very short and at this time indications are for a rather light crop. Cool weather, however, and moisture, if available, may tend to make a somewhat larger crop.

Among the visitors interested in small grains was Professor Tetsu Sakamura of Japan. Professor Sakamura has been doing some very interesting work on the cytology of wheat and wheat crosses. Another visitor during the month was Professor A. T. Wiancko of the Indiana Experiment Station.

MISSOURI

State Experiment Station, Columbia. (L. J. Stadler) (June 16) The condition of Missouri wheat June 1 was 93%, indicating a yield of 72,000,000 bushels, value $160,000,000. The condition of spring wheat was 96% with an increase in acreage of 20% over last year. Barley acreage was 95% of that of last year with condition of 90%. The condition of rye was also 90%. The condition of oats was 92%. The condition of corn was 78% as compared with 88% on the first of June last year. Planting of corn was 10 to 30 days late over the State as a whole on account of the extremely rainy weather of May. Cotton was in the poorest condition ever recorded at this date, about 70%. Much of the acreage needed replanting.

The weather since June 1 has been generally favorable to plant growth with the exception of one heavy rain on the 2nd and 3rd. Wheat rust is very common over the State and a large amount of oats rust has also been reported. The wheat harvest is beginning today on the southern border.

Grain harvest on the Station field will begin at the end of this week. The wheat, oats and barley plots are still in good condition, though wheat rust is extremely common.

IOWA

State Experiment Station, Ames. (L. C. Burnett) (June 21) Storms continue to hinder field work. A thunder storm and wind Friday evening, June 20, lodged the entire oat nursery and several winter wheat plats.

(June 30) Winter wheat is ripening very rapidly, and some will be cut this week. Hot weather has hastened the growth of corn so that some was laid by in June.

GREAT PLAINS AREA (South to North)

TEXAS

Amarillo Cereal Field Station, Amarillo. (John F. Ross) (June 15)
The weather data for the first half of June is as follows: Maximum temperature 91 on the 7th; minimum 38 on the 1st and 2nd; average hourly wind velocity 6.1 miles; precipitation 2.99 inches - from the 3rd to the 15th; and evaporation 3.683 inches. The heaviest rainfall was 1.75 inches on the 9th which was accompanied with some hail and wind. The hail was over a limited area only and the damage varied from less than 5% to as much as 75% on different parts of the station farm. Most damage occurred at the south end of the field. The smut control wheat and D. L. A. plats suffered most. The three plats of winter wheat on the Depth-of-Plowing experiment, though almost in the center of the hail-damaged plats, were damaged only from 5 to 10%.

Unless more hail comes it will be possible to get yield data from all the small grain plats. Row crops were not far enough advanced to be harmed much. Some that were just emerging were covered by soil during the heavy rain.

It has been impossible to get into the field with teams for over a week and the weeds are getting a big start. We have six boys hoeing weeds.

Visitors at the station during the first half of the month: J. H. Martin, County Agent Walker, Lt. C. S. Goldsmith, B. E. Rothgeb, E. F. Chilcott, W. T. Butler, and Dr. E. C. Stakman.

OKLAHOMA

Woodward Field Station, Woodward. (John B. Sieglinger) (June 15)
Rains and showers have interfered with field work to quite an extent during the first half of June. The weeds have made a rapid growth and it was necessary to stop seeding one or two fields of barley in order to control the weeds in the plats. On June 10 a small beating rain fell and packed the surface of the soil and on the following day we had our first soil blowing of the year; it was soon controlled by means of cultivation.

The entire cereal project was cultivated on June 11 and 12 for the double purpose of killing weeds and stopping soil blowing. The fourth date-of-seeding plats emerged to stands on June 10 and 11. The fifth date-of-seeding plats were seeded June 14. Wheat is filling well and is in the dough stage. The broomcorn and sorghums are making rapid growth.

We have done some thinning of the crops and at present are working on the varietal experiment with broomcorn. I expect that most of the thinning will be completed this week.

Station visitors for the first half of June were: W. I. Drummond of the International Dry-Farming Congress; F. W. Wood, Asst. Pathologist of Cereal Investigations; and Mr. Malton of the Biological Survey.

The maximum temperature for the month to date was 85°F. on June 12, and the minimum was 44°F. on June 2. The rainfall for the month has been 1.92 inches distributed as follows: June 1, 0.55 inches; June 8, 0.35 in.; June 10, 0.69 in.; June 11, 0.04 in.; June 14, 0.05 in.; June 15, 0.08 in.; and June 16, 0.16 in.

(June 30) The last half of June has been rather warm; wheat has ripened rapidly and growing conditions have been almost perfect.

The sixth or last date-of-seeding plats were seeded June 30. The fifth date-of-seeding plats emerged to stands on June 19, or five days after seeding. With the exceptions of the last three dates-of-seeding, all of the cereal plats have been hand thinned. The plats were trimmed last week. We will soon complete cultivating the cereal project the second time. There are a few patches of crab grass that will need hoeing.

There are many grasshoppers in the broomcorn and sorghums, but I believe the crops are too large to be injured much by them. We have scattered bran mash around the edges but the hoppers seem to prefer a green diet.

The wheat on the Station was bound last week, most of the farmers in this vicinity will head their grain and are at it hard this week. Harvest hands seem to be scarce; $5.00 per day is the regular wages, and some are offering $6.00.

The maximum temperature thermometer is out of working order but the maximum temperature from the thermograph was 90° on June 26; the minimum temperature for the last half of the month was 63° on June 16 and 17. Precipitation for the last half of the month was June 23, 0.05 in., and June 24, 0.80 in., making a total of 2.77 inches for the month of June. A rain might come in handy within the next few weeks.

KANSAS

Fort Hays Branch Station, Hays. (Arthur F. Swanson) Arthur F. Swanson has been appointed to take charge of the cooperative experiments of the Office of Cereal Investigations at the Hays Experiment Station, Hays, Kansas, to succeed F. A. Kiene, Jr., who resigned April 1. Mr. Swanson received his education at the Kansas State Agricultural College.

During the first half of June, a great deal of moisture fell in this section. Some difficulty in getting into the fields has been experienced and sorghum planting has been delayed. Further heavy rains on June 11 caused some of the wheat to lodge. The ground is in excellent condition to mature the heavy growth of wheat although in some fields, especially in the plat work, the plants are showing some tendency to leafliness and a slowness in heading.

There will be a great demand for Kanred wheat for seed among the farmers. The station is fortunate in having 425 acres of Kanred wheat growing in the commercial fields which can be sold and distributed. It has just been inspected for purity and found to have a very high standard. It is remarkably free from rust, rarely showing more than the slightest trace while adjoining fields of Kharkov are heavily infected.

On a whole, the average germination of all sorghums seeded has been very satisfactory at this station. The only difficulty which has been experienced was where the plantings were followed by heavy cold rains, which caused the seed to rot.

Fulghum Oats (C. I. 708) is showing a vigorous uniform growth and is fully headed. Its nearest competitor at this time is Burt X 60-Day.

(June 30) There has been no rain in this vicinity since June 15, but because of the abundance of soil moisture the wheat crop will mature without injury from drought. The temperature has been relatively high during the last seven days which has favored the ripening of the crop. Harvest generally will begin July 1 and will be in full operation by July 4. Western Kansas will harvest one of the largest wheat crops in its history. The call for harvest hands cannot be filled. Standard wages are 60 cents per hour for pitchers and 70 cents for stackers and header operators. It is reported that in some cases farmers are offering 80 and 90 cents an hour as an inducement to get help.

Sorghums and corn are making rapid growth. In this vicinity the acreage is small as most of the cultivated land was seeded to wheat last year.

Cereal experiments at this station for the year include the following sowings:

125 Head rows of winter wheat
155 Plats of winter wheat
17 Plats of spring wheat, oats and barley
220 Varieties and strains of sorghums
36 Plats of corn

In addition rate and date plantings of both winter wheat and sorghums were made.

State Experiment Station, Manhattan. (John H. Parker) (June 15) Wet weather has continued during the first half of June. There has been a measurable amount of precipitation on 9 out of 15 days, a total of about three inches. This condition has been general over most parts of the state and has resulted in an unusually rank growth of straw, and, consequently, lodging in many fields. In the Agronomy Nursery and at the Agronomy Farm lodging is very severe and will make work of roguing, taking notes, and harvesting extremely difficult.

The wheat varieties at the station have been fully headed for some time, and Nebraska Hybrid and two of the earliest soft winter wheats will be ripe this week.

Oats are all fully headed except some late selections from Texas Red and the late varieties, such as Swedish Select, White Russian, etc. These late selections and varieties will be discarded. The most promising varieties are Aurora, C.I. No. 831, and Kansas No. 5179 formerly known as Nicholson's Red Rustproof but which, according to Mr. Warburton, is typical Fulgrum, and Richland, Iowa No. 105, and Albion Iowa No. 103. These two 60-Day types seem to be distinctly superior to any of the local strains of the same variety. A small field of Kansas #5179 is being grown this year at the Agronomy Farm and preliminary tests are also being made in about five counties. This variety will be further distributed in the cooperative experiments over the state in 1920.

The rod rows of oat varieties inoculated with the loose and covered smuts are fully headed and smut counts have been made. The early white oats carry a relatively high infection and many strains of Burt are only slightly infected.

Hulless oats, as usual, carries the maximum infection. In the oat head rows also inoculated with smut, a rather large number of selections of Burt are entirely free from smut and will be further tested in 1920.

Flax is in full bloom and has made fine growth. The rows have been rogued and now appear to be very uniform as to height, flower color, and other characters.

Mr. C. W. Warburton and Mr. J. A. Clark of the Office visited the Manhattan station June 4 to 7 and discussed the cooperative cereal work with members of the station staff. They visited Hays on June 9 with Mr. Parker and went over plans for the season's work with Mr. A. F. Swanson. A careful inspection was also made of the Hays Station fields of Kanred and Kharkov wheat which were just heading. The Kanred fields were found to be true to type and pure and had a great deal less leaf rust than the adjacent Kharkov fields, the percentage being not over 10 for Kanred and as high as 80 for Kharkov.

CEREAL DISEASE SITUATION IN KANSAS JUNE 15, 1919.
(L. E. Melchers)

The leaf rust of wheat is very prevalent in Kansas this year, having had a good start last fall. It spread to the young plants this spring, causing many fields to be seriously injured. The climatic conditions were extremely favorable for its spread and further development. According to records on hand at the present time, leaf rust is the most severe that it has ever been in the state, with the possible exception of 1916. There are fields in the southern and central parts of the state which are no doubt going to have the yield reduced on account of severe leaf rust infection. Stem rust has also appeared in the southern and central part of the state. If wet weather continues there is sufficient infection in the state to cause loss in some fields.

Septoria leaf spot was prevalent and has now spread to the glumes and in some fields this will cause damage.

Bacterial Black-chaff disease has appeared in many counties in the state. It is still problematical what injury this will do.

BOTANY RUST NURSERY PLATS

An epidemic of stem rust has been secured in the plots where wheats are being tested for rust resistance. This is the fifth successive epidemic. Notes will be taken on varietal susceptibility to stem rust as well as leaf rust. The latter is particularly conspicuous at the Agronomy Nursery, in that it attacks the stems and peduncles severely in the case of many varieties. Outstanding results are being obtained in the case of Kanred which is being grown commercially over the State, in that it is showing marked resistance to leaf rust. The average percentage of leaf rust for Kanred over the State will probably be from 8 to 10 percent, while the average infection for other hard winter wheat varieties will vary from 65 to 95 percent on the leaves and very heavy infection on the stems and peduncles. In the case of P-1066 and P-1068 (closely related to Kanred) the average percentage of leaf rust at the

Agronomy and Botany plats will run between 5 and 8 percent with no infection on the stems.

(June 30) (John H. Parker) The first few days following June 15 continued rainy and cool but the last ten days of the month were hot and dry and caused all of the cereal crops at the Agronomy Farm and in the nursery to ripen very rapidly. The maximum temperature was 100° on June 25 and the minimum temperature was 47° on June 4. The total precipitation for the month was 4.41 inches.

We have been harvesting wheat at the Agronomy Farm and in the nursery since June 24 and it will be completed this week. Oats harvest began today and the early varieties will be all cut this week. Richland, Aurora, and Fulghum (Kansas No. 5179) still appear to be the most promising ones in the nursery.

Smut counts have been completed in the oat head rows, and a number of strains of Burt have been found to be smut free.

The wheat crosses have been collected and a considerable amount of seed was found to have set in the crossed heads.

Field inspection on the farms of over 400 growers of Kanred wheat in various parts of the State has been completed and the reports are now being tabulated; a seed list will be issued about the middle of July. Samples of 50 heads from the Kanred fields and adjacent fields of common varieties of hard, red, winter wheat have been sent to this Department and a statistical study is being made of the length of the beaks on the outer glumes. This character has proven of great interest and value in identifying Kanred wheat and determining percentage of mixture with other varieties. In nearly all cases, Kanred is reported to be from one to four days earlier than other varieties but is lodged to about the same extent, particularly on bottom land. It is also attacked by the black-chaff disease as heavily, or more so than other varieties. It has maintained its record with regard to resistance to leaf rust in nearly all parts of the State and where stem rust was present was also less severely attacked.

Wheat harvest is in progress throughout the wheat belt. Some difficulty is being experienced in getting sufficient help and in saving all the wheat in bottom land fields which is badly lodged.

Agronomists from the mid-west states and the United States Department of Agriculture held a conference at the College June 30 and July 1. The matter under discussion was the formation of plans for conducting the research work in Soil Fertility of the Experiment Stations of the prairie states. State boundaries do not mark boundary lines of soil problems. There are certain regional soil problems common to Kansas, Nebraska, South Dakota, North Dakota, Minnesota, and north into Canada. It is planned to have the states in this region cooperate in solving their common problems. The work planned will be carried on by the existing machinery of the State and Federal departments of agriculture.

The conference continues at Lincoln, Nebraska, and at Ames, Iowa, closing there on July 4. The idea of this cooperation is an outgrowth of the work of the National Research Council. Delegates to this conference were:

Oswald Schreiner, Soil Fertility Investigations, Bureau of Plant Industry, U. S. Department of Agriculture.

Curtis F. Marbut, Soil Survey Investigations, Bureau of Soils, U. S. Department of Agriculture.

Frank T. Shutt, Central Experiment Farms, Province of Ottawa, Canada.

F. J. Alway, Chief of the Division of Soils, St. Paul, Minnesota.

H. L. Walster, Agronomist, North Dakota.

Chancellor Avery, University of Nebraska, Lincoln, Nebraska.

W. W. Burr, Agronomist, University of Nebraska, Lincoln, Nebraska.

T. A. Kiesselbach, Agronomist, University of Nebraska, Lincoln, Nebraska.

R. I. Throckmorton, Kansas Experiment Station, assisted by members of the Agronomy Department of the Kansas State Agricultural College.

(June 30) (L. E. Melchers) The past two weeks has shown some change as to the rusts of cereals in Kansas. Stem rust became quite prevalent in southern Kansas. Many of the fields showed as high as 50% infection. Had this infection appeared a week or ten days earlier, there would have been serious loss in some parts of Kansas.

The leaf rust situation in the state did not change in the last two weeks. The infection was heavy on the culms and in many cases on the peduncles of the plants. Injury from leaf rust on mature plants would be very hard to estimate this year. In many cases, there will be no appreciable injury, although infection was quite heavy. Leaf rust did the most injury by attacking some fields very early and not allowing them to come into the heading stage properly. Such fields were plowed up.

Black-chaff was quite prevalent over the state. In most cases there was merely a trace of it on the plants, confined to the glumes. Some fields showed spots where Black-chaff was very prevalent, attacking the peduncles of the plants. In such cases shriveling of the seed resulted. Considering the abundance of rain and the lodging of the wheat, Black-chaff was not as serious as might have been anticipated. Kanred showed considerable of this disease and, as in 1917, had more of the Black-chaff than most other varieties.

Septoria on the glumes was very prevalent in most fields, although not as much as Black-chaff. The amount of injury due to Septoria infection was not as serious as that caused by Black-chaff. It was conspicuous in low spots and in places where the wheat was lodged.

"White heads" in wheat due to various causes, some of them very indefinite, were very common in many fields, running anywhere from a trace to 8 percent.

The failure of many of the wheat heads to fill properly was common in many fields. Apparently a combination of climatic and soil conditions, together with lack of proper seedbed preparation were factors entering into this condition. Most of the fields showing this condition seemed to have plants with poorly developed root systems.

Harvesting the rust nursery commenced today and will be completed this week.

COLORADO

Akron Experiment Farm, Akron. (F. A. Coffman) (June 15) Weather conditions during the first half of June were very unusual. Three frosts occurred: June 1, 2, and 3. On June 3, the temperature dropped to 31 degrees F. and considerable damage was done to those crops unable to withstand freezing temperatures. This resulted in a great reduction in the stands of corn in the fields on the station. Cut worms and squirrels also did considerable damage to the corn.

Winter wheat prospects are the best this country has known for several years. Before the precipitations of June 1 to 4, the ground was becoming very dry and in many places the wheat had begun to burn. These rains relieved the situation. In some localities, however, the wheat was greatly damaged and did not fully recover. This is especially true to the west and south of Akron.

Prospects on the station are very favorable, although a rain would be very acceptable at present, no precipitations worth while having been recorded since June 4. The spring wheats are heading; Prelude (C.I. No. 4323) being practically in full head. Oats are heading, and all but the later maturing varieties of barley are heading. All of our spring cereals are growing well with the exception of the proso crops which germinated poorly, and the buckwheats which were killed by frost. It will very likely be necessary to reseed the millet, proso and buckwheat plats.

All of the nursery crops are growing well. It has been too dry for any rust infestation whatever, so as far as the rust on the different varieties sent to this station to be tested for rust resistance is concerned, no results have been obtained.

(June 30) June was a rather disastrous month for this portion of Colorado. Extremely low temperatures, for this time of the year, prevailed throughout the first part of the month. As a result we had snow on June 1, and frosts were recorded June 1, 2, and 3. The cool weather, which was accompanied by considerable precipitation, aided the crops to recover from

the effects of the droughty weather during May and also the frosts which occurred the first few days of the month. Following the cool wave during the first part of the month, the weather turned hot and windy and remained such for the remainder of June. This has resulted in the ground becoming baked and cereal crops have suffered severely where they have not been actually burned up.

Corn and sorghum crops have suffered much less from the adverse weather conditions than have the spring wheat, barley and oats. Corn was severely hurt by the frosts which came early in the month. In many fields the stand was reduced from 15 to 20 percent. Fortunately, most of the sorghum had not yet emerged. Where emergence had taken place, replanting was necessary. At the present time the prospects for both corn and sorghum crops are exceedingly bright.

Potatoes were severely set back by the frosts. The potatoes in this section of the state are being badly attacked by the Colorado potato beetle. In many fields it will be necessary to spray the vines in order to save the crop.

An unofficial trip was made to Denver, Colorado, during the week of June 15. The irrigated section around Ft. Morgan and Brush, Colorado, is suffering from a shortage of water for irrigation. Some fields of wheat in this section have been severely hurt by the water shortage. In the dry-land section of the State, just east of Denver, crops have suffered severely from the lack of moisture. The precipitation in this part of the state has been only half the normal precipitation all spring. The crops in the South Platte river valley, which is an irrigated section southwest of Denver, are in fine condition.

Grain on the different Cereal Investigations projects at Akron Field Station has withstood the adverse weather conditions as well as could be expected. One field of Kanred (C.I. No. 5146) wheat growing on the station promises to give us a yield of between 25 and 35 bushels. This wheat is in the hard dough stage. Most of the winter wheat fields in this part of the state will be ready to harvest before the 10th of July.

Spring wheat on the station is possibly the best we have had since 1915. Most of the spring wheat fallow plats have withstood the dry weather without much trouble, but the cornstubble plats have suffered considerably. Only the earliest maturing varieties of spring wheat have started to ripen. The early maturing varieties of oats have started to turn. The later varieties have not fully headed and it is very doubtful whether the late-variety plats on cornstubble will ever fully head. The cornstubble plats of oats are suffering severely from the hot, dry weather. Barley on fallow has withstood the unfavorable weather very well. The cornstubble plats have suffered considerably and as a result many of the plats will never fully head. The earlier varieties of barley will soon be ripe enough to harvest.

The night of June 22, a herd of range horses got into the station and severely damaged the Cereal Investigations nursery. Our experiments with spring wheat were totally ruined and no results of any experimental value

are possible. Although considerable damage was done to the nursery experiments with oats and barley, the damage was far less than that done to the spring wheat. A few nights later the same herd came back and proceeded to clean up the field plats of emmer. The barley plats, though injured, were not seriously damaged, but the emmer plats were completely destroyed.

Mr. C. W. Warburton, in charge of the oat experiments of the Office of Cereal Investigations, visited the station June 11 and 12. The oats experiments on the station were gone over and a few changes are being contemplated.

Mr. W. B. Coffman, until recently in the Barberry and wheat-rust study in Kansas, visited the station July 1.

The weather records for the month of June at Akron Field Station show: minimum temperature 31, maximum temperature 96, total precipitation for month, 2.74 inches.

WYOMING

Cheyenne Experiment Farm, Archer. (A. L. Nelson) (June 15) The month of June has not in any way broken away from the continued dry spell which holds this region with a tight grip. The total precipitation for April, May, and the first fifteen days of June is 1.07 inches. The total precipitation for June thus far is .14 inches. It should be borne in mind that on June 1 we had a snow followed by a minimum temperature of 27 degrees which froze all corn, beans, potatoes and the like, which were above the ground. The maximum temperature was 88 degrees and the evaporation has been high.

The winter wheat is burning badly. It is beginning to head but seems hardly strong enough to complete this process of growth. The seeding on fallow is burned worse than that seeded on oat stubble. However, in either case, the crop has been greatly injured and the final yields reduced, even should rain come soon.

The early date-of-seeding experiments with spring small grains are burning and the late seedings made poor germination. Good stands were secured on all varietal experiments with spring grains with the exception of flax. These crops are also burned to some extent, the flax being more seriously effected. The seedings on corn stubble are not burning as badly as those on fallow.

Very poor stands of grain have been secured on spring-plowed land. This condition is especially true of the corn.

The roads have been disked and dragged and alleys as well as the varieties of corn have been hoed.

The trees at the station, except some of the ash, have been severely winter-killed. However, they are all starting growth from the root.

(June 30) June was a continuation of the spring drouth. The total precipitation was .59 inches. It started with a snow storm and freezing temperatures on the first of the month, then turned hot and dry. Rain on July 1 greatly helped crops.

During the month the winter wheat burned very badly. Light showers brought most of it into head. During the past ten days some of the plants as well as half of some of the heads have died.

The spring grains, while badly burned, have held their own. Prelude headed, but the squirrels were on hand and ate off two fortieth-acre plats of this variety. The damage to other grains was very slight. Squirrels have been poisoned in the vicinity of the farm several times but the severe drouth seemingly drove them from the prairie. With a gun, grub-hoe and poison oats at work, the squirrels found no quarter.

The Russian and Canadian thistles are quite numerous and give trouble. Outside of weeding, the work at the station has included cutting a field of rye for hay and putting it into the stack.

The station address now is P. O. Box 298, Cheyenne, Wyoming.

Sheridan Field Station, Sheridan. (Leroy D. Miller) (June 7) The first five months of this year have been a series of broken records as to weather conditions. The mean temperatures for these months have all been equal to or above normal, no month has gotten its normal precipitation, and January and May shattered all previous records (26 years) as to maximum temperatures for the month. The highest temperatures previously recorded for January and May were 60 and 91 respectively, while this year they were 62 and 96. Normally, on June 1 we should have received 7.36 inches of precipitation, while we have received 2.63 inches, leaving a shortage of 4.73 inches. In May we received .99 inches while the normal is 2.74 inches.

With the above climatic conditions this year, it is not surprising that winter wheat is burning, but it is surprising that it has not burned more than it has. All winter wheat plats in the variety and rate and date of seeding field are burning, but none of them are burned beyond recovery. The thicker rates of seeding, burned most, are forced into head from 1 to 2 days earlier than the thinner rates of seeding.

Spring wheat, oats, and barley varieties, as well as rates and dates of seeding, are burning slightly, with the oats showing the effect most.

Flax varieties planted around May 15 have not come up, due to shortage of moisture. One could not recognize these plats as flax plats.

Prelude spring wheat showed the first heads on the 6th, it being in a very poor condition when it begun. It stands around 6 inches high.

(June 14) The drouth we have had to experience this spring was ended on the 10th and 11th by rains of 1.04 inches. Hail accompanied part of the rain, but the rain coming first, wet the crops up sufficiently so that the hail did but little damage. There was considerable runoff and washing of debris onto plats. It was noted that the hail did more damage among the rates and dates of seeding of wheat, oats, and barley than further to the south among the varieties. However, the damage done to crops by hail was more than offset by the good done by the rain.

Prelude wheat is fully headed, and the first two seeding dats and all of the rates of spring wheat are just coming into head. Sixty, Day, Sixty Day Select and Iowa 103 oats are heading. Mariout and Coast barley are also heading, with White Smyrna just coming into head.

The following are the weather conditions for the past week as shown by data collected: Maximum, 96°; mean maximum, 80°; minimum, 42°; mean minimum, 47°; evaporation, 1.499; average wind velocity, 6.4; and precipitation 1.06 inches.

(June 21) The weather for the past week as shown by data collected, was as follows: Maximum, 100°; mean maximum, 90°; minimum, 50° and mean minimum 57°; evaporation, 2.124 in.; average wind velocity, 6.9 mi.; and precipitation T. Although the weather has been cloudy a good share of the week, they did not bring rain. The rain reported last week was such a dashing one that but little of it was saved. However, most crops have benefited by it, but are about to begin again to suffer from drouth. Wheat, oats, and barley of

all varieties here are headed or are beginning to head. A number of them are heading so low that it will be with considerable difficulty that they can be harvested with a binder. All winter wheat plats on this project are looking particularly well, considering the sort of season we have had so far. All are headed now and many are filling very well.

(June 28) All records for Sheridan in 25 years as to high temperatures have been broken three times during the past week. The highest temperature formerly recorded was 101°, but we have had this week two days of 104° and one of 105° on the station. No relief from drouth has come in the form of rain, and spring-seeded crops look hopeless for July and August, which are our dry months, are just ahead.

The weather for the past week as shown by data was as follows: maximum, 105°; mean maximum, 101°; minimum, 54°; mean minimum, 63°; evaporation, 2.538, with .523 on the 26th; precipitation T; and average wind velocity, 5.9 miles.

Winter rye will soon be ready for harvest, and is filling well. Winter wheat is just beginning to turn in color on the earliest-seeded plats and is very well filled. The above two crops will make a very good yield unless something happens to them before they can be harvested, season considered.

But little can be expected from any spring-sown small grain or flax.

SOUTH DAKOTA

General. Crop conditions are good throughout the state except on the lower lands which have been flooded and in the extreme western section where there is a shortage of moisture. Harvesting of the hay and forage crops is well under way. Pastures are in good condition and winter rye is rapidly approaching maturity. Conditions are especially good in the James River valley section between Aberdeen and Mitchell.

Belle Fourche Experiment Farm, Newell. (A. D. Ellison) Dry, hot windy weather prevailed here during practically the entire month of June. Maximum temperature for the month of June was 107 degrees; minimum, 32 degrees; precipitation 0.35 of an inch.

Good stands of spring cereals sown on dry land have been obtained, but they are drying up rapidly for the want of moisture. Cereal crops growing under irrigation are in good condition. They were irrigated for the second time on June 26 and 27. Wheat, oats, and barley are practically fully headed. Flax varieties have finished blooming. Millets on both dry and irrigated land seem to be making fair growth.

Brookings. (Manley Champlin) Wet weather continued until the latter part of the month, interfering with field work to a greater extent than at any time since the station has been established. Most of the corn has been cultivated once, but there are some places on the corn plats that have not been cultivated yet on account of mud. Considerable washing occurred which will interfere to some extent with the fertilizer experiments, soil from one plat washing on to another in various parts of the farm. No serious diseases have been noted in the cereals. Nearly all of the cereals are headed and rye is

rapidly approaching maturity. During the past week the weather has been drier and some progress has been made in harvesting the forage crops.

Cottonwood Substation. (Manley Champlin) There has been sufficient moisture to date to keep crops growing nicely. Rains have delayed work but very little. Prospects at the present time are favorable. Labor shortage continues. It seems to be very difficult to secure men who are willing to go to that section of the country to work when wages in the more thickly settled portions of the state are at their present high level and there is practically no local labor available. Advertisements have been placed in several of the state papers in order to try to secure more help before harvest.

Eureka Substation. (Manley Champlin) Cereal crops are for the most part headed and in excellent condition. Rainfall to date has been very well distributed and not over abundant, just enough to keep the crops growing nicely. Good stands of sweet clover and alfalfa seeded this spring have been obtained. With one or two rains between the present and harvest time, the Eureka crop should be as good as any that has been raised during the nine years since the station was established.

Highmore Substation. (E. S. McFadden) No Report.

Vivian. (Manley Champlin) Crop conditions are excellent. All cereals are doing well, except a plat of Acme durum wheat on manured land which was lodged by severe wind and rain storm. Corn was injured somewhat by the cut worms, but seems to be making a fair stand on most of the fields.

NORTH DAKOTA

State Experiment Station, Agricultural College. (Theodore Stoa) Crops are appearing very good at this date throughout the Red River Valley. Considerable rain has come to this district with the result that all crops show a heavy stand. Because of this there is some concern about rust this year.

The grasshoppers, which are such a problem in some of the western counties of the state, have also made their appearance in this section. Some farmers have reported the destruction of a considerable acreage, especially alfalfa. This problem has come to attention within the last few days.

Wheat is heading in this locality at the present time. Early oats headed about ten days ago.

Northern Great Plains Field Station, Mandan. (J. C. Brinsmade, Jr.) Except for a little cold weather early in the month, June has been very warm. Maximum temperature for the first half of June was 92° recorded June 13 and 16, and for the last half it was 102°, recorded June 30. Minimum temperature for the first half was 32°, recorded June 3, and for the last half 58°, recorded June 18 and 23. Precipitation for the month amounted to 1.12 in. There have been very hot winds from the south blowing almost constantly the last four days of June. A good rain is much needed but so far the crops have not suffered greatly from drought.

It was evidently cutworms that did so much damage to the stands of flax the latter part of May. Flax sown in June, however, seems to be little damaged by cutworms.

Flax in the first three dates of seeding is in full bloom. Marquis and Acme wheat, Sixty Day oats and White Smyrna, Mariout and Coast barleys are fully headed, and all other varieties in plats are partly headed. Weeds are not nearly so bad as in 1918 and are well under control.

The Office has been well represented here lately. Mr. C. M. Woodworth was here June 16 to 22 attending to seeding and stand counts of flax. Mr. T. E. Stoa was here June 24. Mr. W. E. Brentzel was here June 11, and is here again now, having arrived June 30. Mr. C. S. Reddy is also here now, having arrived July 1.

Dickinson Substation. (Ralph W. Smith) (June 15) The dry weather which has continued for about a month was relieved by a rain of 0.39 inch on June 12. This will be of much help if more rain follows. The early grain was badly in need of rain and late-sown crops had not germinated for lack of moisture, especially oats, flax, and millet. Rainfall on June 12 was reported from many points in this state and Montana.

The grasshopper situation still remains serious in places, although the poisoning campaign is being systematically carried out in this county and adjoining counties. Hopper dozers are being used with success in some localities. The hoppers on the Substation are being held in check by repeated poisoning.

All cereal plats have been trimmed and the roads and alleys have been cultivated.

The winter rye is fully headed and the winter wheat is beginning to head.

Severe winds during the past two weeks have done some damage by drifting the soil and cutting off the grain. Damage from this source at the Substation is very slight. A few light frosts early this month did slight damage to tender crops in low places. The last one occurred June 9, the temperature being down to 30 degrees.

During the week the station was visited by former Superintendent J. C. Thysell and by J. O. Belz from the Office of the Biophysical Investigations.

(June 30) During nearly every year some new weather record is made at this station. The present year is no exception. The mean temperature for last January was the highest ever recorded here. The month of June was not only the hottest but the dryest ever recorded at this station. The mean temperature for the month was 70 degrees as compared with a normal of 61.7 degrees. The precipitation was 0.52 inch as compared with a normal of 2.98 inches. The May rainfall was about normal but nearly all the precipitation occurred during the first half of the month. The maximum temperature for the month was 108 degrees on June 29. This was accompanied by a severe wind which was accompanied by a severe wind which, needless to say, was a hot one.

The crops are naturally in a critical condition. If abundant rains should fall soon, some fields would still produce something. Grain on corn and potato land or on fallow looks best. Due to the dry fall, very little

fall plowing was done last year. This, together with the late spring, necessitated disking in a great deal of grain on stubble land. These fields are in bad condition, partly due to the drouth and also because the grasshoppers and cutworms are more numerous there. In some fields the latter have done more harm than the grasshoppers. The grasshoppers are being fairly well controlled in this county by poisoning.

The dry, hot weather has hastened the growth of crops so that early varieties of wheat, oats, and barley are fully headed and the latest varieties are beginning to head. Winter rye will soon be ripe. Corn planted May 9 on the rotation plats is knee high and is tasseling.

Crosses have been made between different varieties of winter wheat totaling 50 crossed heads. Most of these were crosses between Buffum (C.I.3330) and one of the following: Turkey (C.I.3084), Beloglina and Kanred. The Buffum and Turkey (C.I.3084) have shown the highest percentage of winter resistance at this station for a period of years. Crosses are being made between spring wheat varieties, mostly rust resistant and beardless durums.

It is planned to hold the annual picnic at the Substation on July 18.

MONTANA

Judith Basin Substation, Moccasin. (P. V. Cardon) No Report.

CROP CONDITIONS IN MONTANA (C. W. Warburton)

Crop prospects in Montana are unquestionably poorer than in either 1917 or 1918 at this time. The drouth has been practically continuous and is State wide, conditions west of the Divide, particularly in Beaverhead County, being as bad or worse than in other sections of the State. As an example, March precipitation at Great Falls was 0.53 inch, which is 0.27 inch less than normal for that month. April precipitation was 0.12 inch, 1.03 inches less than normal. I do not have the complete record for May as the Section Office in Helena does not send out reports on Sundays and holidays, but with these exceptions, the May rainfall was 0.37 inch. There was a shower on May 29 and also a little rain on other days not included in the report, but the total for the month would not be more than 0.75 inch, and it is probably less than that. The heaviest rain of the year fell on June 12, amounting to 0.56 inch with a total of 0.74 inch in June to date. This record is quite typical of the entire State. Yellowstone Valley had one good rain during the first week in May, and the total precipitation at Havre, Glasgow, and Lewistown is somewhat greater than at Great Falls.

Coupled with the low precipitation, we have had extremely high temperatures much of the time since May 19. The average maximum temperature for the six days from May 19 to 24 was 90 degrees with the maximum for the week of 97 degrees. The following week was even hotter, until the rain of May 29, the maximum for the week being 100 degrees. This was followed by a very sudden drop in temperature with light frosts, but by the end of the first week in June, temperatures were again well up in the eighties. The average so far this week is a little above 90, 92, 95, and 100 being recorded in the past three days. There is no moisture in the soil so you can imagine what these temperatures are doing to crops.

A few fields of winter wheat south of the Yellowstone River in Rosebud County showed promise of making more than five bushels to the acre when I was there on Monday, but with the hot weather we have had during the past week, that estimate would be high at this time, I am sure. The early May rain there caused thick stands and rank growth of spring wheat, but the hot dry winds since have caused this to burn badly, and most of the fields now are brown at least in spots. Only a small part of the spring wheat will head at all. The same condition prevails in the Winnett section of Fergus County, which I visited Wednesday, and County Agent Peterson says that the northern part of the County is no better. Crop prospects in the Judith Basin are the poorest ever known. In the western part of the Basin, all late sown spring wheat fields are very spotted as there is not sufficient moisture for uniform germination and a third to a half of the land is bare. There were showers in Fergus County Thursday which may have improved conditions in some localities temporarily, but yields are certain to be very poor.

Cascade, Teton, Toole and Chouteau counties are fully as bad as any of those I have mentioned in detail, but the other counties in the northern part of the State still show some promise. This is in part due to the fact that the crop is not quite so far along there as it is further south, and in part to more frequent local showers. Temperatures have been very high in both Havre and Glasgow, however, and unless the showers continue to be frequent, I do not think these counties will be in any better shape by the end of next week than the rest of the State.

Not only are crop prospects very poor on the dry land, but there is a decided shortage of water for irrigation as there was little snow on the mountains last winter and this is practically all gone. The only snow now visible in the Big Snowy Range is at one point on the north side of a sheer cliff. Yields of alfalfa hay on irrigated land are of necessity much less than usual and there will unquestionably be a forage famine in the State next winter if not at a much earlier date. The lamb and calf crops were never better so that very heavy shipments of both cattle and sheep must be made or losses during the fall and winter will be great.

WESTERN BASIN AND COAST AREAS (South to North and West)

UTAH

Nephi Substation, Nephi. (Aaron F. Bracken) June has been a month of unusual extremes. On the 1st, a temperature of 25 degrees occurred, followed by 28 degrees on the 2nd, and during the last ten days of the month every day brought a maximum temperature of 98 to 99 degrees. The low rainfall continuing from December 1, 1918, struck a climax in June: not even a trace of moisture fell. With such extremes occurring at critical periods in the development of wheat, it seems almost impossible that failure is not the result. On June 1, most of the grain in this section, including that on the station, was fully headed. About fifteen percent was frozen but the damage was limited to the low places. The wheat on the station and that in the surrounding fields suffered no damage. During the last part of the month the heads of the grain were filling, but neither the drouth nor the high temperatures with considerable wind prevented full sized kernels from forming. The average yield of the wheat in this section, not including that which was frozen, will be near 15 bushels per acre.

All winter grain crops on the station will produce normal yields; spring grains about half normal; beans, failure; corn, potatoes, and peas very low yields if not failures.

During most of June, the work on the station was limited to weeding of fallow plats and cleaning of roads and alleys. In addition, all the buildings received a much-needed coat of paint. Harvesting began on June 28, an unusual early date for winter wheat to be ripe in this section.

IDAHO

Aberdeen Substation, Aberdeen. (L. C. Aicher) The weather for this section of the state has been considerably warmer than usual. The hot dry weather coupled with the lack of irrigation water for the irrigated lands will reduce crop production on this project very greatly. The precipitation has been far below normal for the first six months of the year. The average precipitation January to June, inclusive, is 5.16 inches. This year only 2.81 inches have fallen in the same period.

The dry land crops are practically all burned up. What the weather has not eliminated, the ground squirrels and rabbits have been able to finish up. Dry farmers are packing up and either preparing to work on the irrigated lands or in railroad shops and other places of employment. A few more each year nail up the doors and windows and abandon the land entirely. This year will probably cause more to leave than have left in the past, as this makes the fourth year of serious crop failure on the dry lands. New irrigation projects just opening up in other sections of the Snake River Valley are claiming many of these dry farmers. It is practically impossible to obtain loans on dry lands in this section, dry farmers advise. Farm Loan organizations have already been forced to take over many farms on small mortgages formerly considered a very safe loan on such land.

The dry land crop shortage will be felt all over southern Idaho this year. The famous Rexburg bench and upper Snake River valley section, which has always produced grain, will be very short of normal production this year. The American Falls district will also be very short of its normal production.

Owing to lack of normal snowfall in the mountains this past winter, the irrigation farmers are already feeling the water shortage. The Twin Falls North and South Side tracts, two of the largest and best tracts in the State, have used up practically all of their storage water in the Jackson Lake and will very probably be out of water entirely by the 10th of July, unless rains in the mountains should swell the river temporarily. The Aberdeen-Springfield tract has about 2 weeks run of storage water remaining and when this is used up will be in the same condition as the Twin Falls projects. The very old Canal Systems in the upper end of the Snake River Valley which have the prior rights to the water in the river will be the only projects, depending on Snake river flow, to have sufficient water to carry them throughout the irrigation season.

The former dry farm on the Aberdeen Station has all been leveled and made ready for irrigation and some of it was irrigated preparatory to sowing alfalfa. This land has been ready to sow for some time, but owing to the serious water shortage, the Canal Company has advised that the seeding better

not be made as there would not be sufficient water to carry the crop through the season.

The cereals, peas, potatoes, and beets, are growing nicely on the irrigated section of the Station. The cereal nursery is in excellent condition and it is hoped that the small amount of water still available will come in time to save all these crops. Barleys are all fully headed; oats in the plat are all headed: and practically all the wheats in the plats are fully headed.

Mr. Pope and Mr. A. L. Markley arrived a few days ago and are busily engaged in barley investigation. Prof. Hungerford, formerly of the Office, now Pathologist at the Idaho Experiment Station, was a recent Station visitor. President Lindley of the State University visited the Station during the latter part of May.

OREGON

Harney Branch Station, Burns. (Obil Shattuck) The first 15 days of June have been spent in seeding and trimming plats, harvesting, and summer fallowing. Following the severe frost of May 31, it was necessary to harvest all of both dry-land and irrigated alfalfa. The winter rye increase was in the boot or just starting to head, so was entirely killed. This was harvested for hay. Since cutting, the rye has been growing vigorously. The second growth alfalfa is well started and all of the crops have brightened up during the last week.

Poisoning of sage-rats and grasshoppers has been thorough on the station, and these pests are well under control, though not entirely eliminated as yet.

The weather conditions during the past 45 days have been extreme; a short tabulated review should prove of interest. The fact that many of the crops still show up rather favorably will be a pleasant surprise after giving the following data some attention:

Month:	Date:	Temperature:
May	2	32°
"	3	24
"	4	19
"	5	32
"	6	22
"	7	25
"	10	24
"	11	29
"	12	25
"	13	27
"	18	30
"	24	31
"	30	23
"	31	18

Month:	Date:	Temperature:
June	1	21°
"	2	32

June	3	30°
"	4	28
"	7	27
"	8	32
"	11	25
"	12	26
"	13	29
"	14	28
"	16	32

While most of the crops are in pretty fair condition, unless an inch or more of moisture falls during the next three weeks the majority of the crops will fail.

Sherman County Branch Station, Moro. (D. E. Stephens) The month of June was unusually dry, the total rainfall being only .07 of an inch. This is the lowest rainfall on record for June, the normal being .85 of an inch.

Fortunately the weather has remained fairly cool. The highest temperature was 89 degrees on the 18th, and the lowest was 34 degrees on the 9th.

On account of the dry weather during May and June, most of the grain on shallow ground burned so badly that it had to be cut for hay. Winter wheat is ripening rapidly, a few varieties being nearly ready to cut. Notwithstanding the dry weather during the growing season, yields of from twenty to twenty-five bushels per acre are expected from most of the winter wheat varieties. It is yet too early to predict the yields of the spring grains, but they will undoubtedly be considerably lower than the yields of the winter wheat.

Smut counts are being made in the cereal disease nursery and some interesting data are being obtained on the susceptibility of different varieties and pure lines of wheat. Of the 121 pure-line Crimeans sown in two-rod rows with smutted seed, there are a few pure lines that show less than 3% smut while some have more than 90% smut.

June 14 was Farmers' Day on the Station. About 150 farmers were in attendance. Director Cordley of the Oregon Experiment Station and Messrs. Westover and McKee of the Office of Forage Crop Investigations of the Department were recent visitors at the Station.

WASHINGTON

Adams Branch Experiment Station, Lind. (M. A. McCall) No Report.

CALIFORNIA

Plant Introduction Field Station, Chico. (V. H. Florell) (June 17) I have just this evening returned from a trip to Stockton and vicinity and the University Farm at Davis with Messrs. Clark and Martin on an observation tour of commercial and experimental wheats. The wheat crop at both of these points is generally good and is ready for harvest. Combines are operating throughout the wheat belt. The early-sown grain is everywhere producing the highest yields The grain sown in November and December is much more plump than that of later sowings. Much of the latter was more or less pinched and shriveled by north

winds. Most of the fields observed, however, were early sown. Very little shattering was observed.

The leading variety of wheat in the vicinity of Stockton apparently is Early Baart, the distribution of which is being vigorously pushed by the Sperry Flour Co. of that place. This wheat is showing up well and has been subjected to very little shattering, in direct contrast to some of the earliest fields in the vicinity of Chico. Another wheat which is popular with the Sperry people and is being distributed and grown commercially around Stockton is Bunyip. Several good fields of this variety were observed.

Threshing is in progress at Davis and high yields of grain are being reported. The Hard Federation wheat is popular with the men at the University Farm.

The barley and wheat in plats at Chico were harvested during the first week in June. The harvesting and bagging of the nursery barleys was completed on June 13. The oats in the nursery have been harvested and the harvesting of the nursery wheats is in progress. Nearly all wheats in the Classification Nursery are fully ripe. The flax rows are ripening rapidly. It is expected to begin threshing next week or earlier, if possible.

Messrs. J. A. Clark and John Martin of this Office arrived on June 13 to spend ten days or two weeks in making investigations of the wheats in the Classification and Breeding Nurseries.

Very little oppressively hot weather has been experienced so far this season in June. On one day, however, a temperature of 109 degrees F. was recorded.

(June 30) The threshing of the cereals in the field plats was begun and completed last week. White Federation wheat, C. I. No. 4980, and Poda barley, C. I. No. 652, were the leading varieties in their respective classes of grain. The threshing of the nursery material will be begun tomorrow.

Dr. Love's breeding material has been worked over and will be ready for shipment as soon as the rows harvested for yields will be threshed. The selection in the Cereal hybrid nursery will be completed tomorrow.

Flax varieties are ripe but the yields will be very light.

Commercial grain fields are fully ripe and are being harvested as rapidly as possible. A fairly good crop is reported, although the early June hot period curtailed the yield of late-sown grain.

June temperatures have been very agreeable this year.

Dr. Stakman of St. Paul, Minnesota, visited the station on June 21. Messrs. Clark and Martin left for Corvallis and other points in the Northwest on June 29.

Rice Field Station, Biggs. (Jenkin W. Jones) The past month we have plowed the fallow land, including that in the water-grass eradication experiment.

All rice at the station is now submerged. We began holding the water on June 17, and had all plats submerged by the 21st. Rice is growing slowly, due to the cool weather. Cotton and sorghums are making but little progress.

Water grass is bad on the station, and elsewhere. Three men have been working 3 days on five tenth-acre plats and they will be there three more days before they are free from grass.

Water is not any too plentiful at present, due probably to the fact that a large number of farmers are now holding water, and it takes a great deal of water to submerge a large rice acreage.

The maximum temperature for June was 102 degrees (June 5); the minimum, 50 degrees (June 16).

Dr. Gieger is making observations on the mosquito situation in the Sacramento Valley. His headquarters are at Chico. Dr. Giger was here about one month ago. Mr. Mars who is assisting him, was a station visitor June 26. He stated that he would probably call once a week during the period of submergence to make observations on mosquito breeding at the station.

J. A. Clark, John Marvin, and Victor Florell, of Cereal Investigations, were station visitors June 16.

Mr. Silverio Apastol, Chief, Plant Industry Division, Bureau of Agriculture, Manila, Philippine Islands, was a station visitor June 25.

From the Rice Journal for May, 1919, I copy the following comment by the Editor of the Colusa Herald.:

> "Rice growing must be studied. The growers themselves must apply their minds to it, and keep accurate account of their experiences. The state of California has got to help. The University of California ought to have an appropriation of $50,000 at least, for experiments. The federal Government is said to have failed almost completely in its efforts to conduct experiments, due chiefly to the top-heavy, water-logged condition of affairs back at Washington - too much bureaucracy and red tape."

ARIZONA (A. D. Ellison)

Crops in general throughout the Salt River Valley are in good condition. Several fields of Early Baart, Sonora and Kanred varieties of wheat are giving good returns. Early Baart, however, appears to be the predominating variety grown in the valley. One plat of this wheat grown near Mesa, Arizona, and thrashed on May 27, gave a yield of 54 bushels per acre.

Wisconsin barley and Texas Red oat show very promising results in the Salt River Valley. An excellent stand of Texas Red oat was obtained on the University Farm at Mesa, Arizona. It appears to thrive and mature a good yield

on the sandy clay soil and under the general weather conditions prevailing in Southern Arizona. Practically all cereal crops in this section have been harvested and are now being thrashed.

Flax, a comparatively new crop in this section, seems to grow to good advantage on the heavier soils. Experiments with this crop in the Salt River Valley and on the Yuma Project are showing comparatively good returns. When sown early as a winter crop, flax grows to better advantage on the heavier type of soil than on silt, sandy, or mesa-wash soils. Harvest and thrashing of cooperative flax experiments in this section are being finished this week.

26917

CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

ooo ooo

Vol. II. July 31, 1919, Field Station Issue. (July 1—15) No. 11

MOVING PICTURES

These are moving times. On July 16 the Office began moving to the building at 1306 B Street, S.W., long occupied by Forage-Crop Investigation and the Congressional Seed Distribution. Moving was practically completed in three days, but the settling process still continues. Some vexatious delays have resulted from the moving, but in general it was accomplished with a minimum of lost time and a maximum of good nature. It is felt that our new quarters will be adequate and satisfactory when cleaning and settling is completed.

AN ADDITION TO THE FAMILY

On July 16, the Office of Corn Investigations was officially united with the Office of Cereal Investigations. This was easily accomplished as the appropriations are carried in one item in the Agricultural Appropriation Act. The personnel of the corn investigations project occupy rooms on the second floor. This increases the official family by some 13 members and, doubtless, will result in mutual benefits to both the work and the workers.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North).

LOUISIANA

Crowley Rice Station, Crowley. (J. Mitchell Jenkins). June 30. The lowest temperature during June was 71 degrees registered on the 16th, and the highest was 94 degrees registered on the 17th. The toual precipitation for the month was 2.57 inches, and the greatest precipitation in 24 hours was .9½ inches on the 24th. Rain occurred on 13 days during the month. While these rains were light, their coming after the heavy rains of May, prevented the drying of the soil and prevented preparation and cultivation. This condition has greatly delayed the seeding of soy beans. All rices are flooded. Plats are more weedy than usual, due to floods in the fall and spring having distributed seeds and hastened germination.

Mr. Itizo Kasiwagi, Professor of Chemistry, Higher Technical School, Yokohama, Japan, called at the station on June 9.

GEORGIA

State Experiment Station (Athens) and Substations. (R. R. Childs). No report.

TENNESSEE

State Experiment Station, Knoxville. (C. A. Mooers). No report.

NORTH CAROLINA

State Experiment Station, West Raleigh. (G. M. Garren). No report.

VIRGINIA

Arlington Farm, Roslyn. (Henry P. Ames). July 1-15. The maximum temperature for this period was 101° on July 4; the minimum 52° on July 1. The rainfall was as follows:- July 7, .22 inches; July 10, .79 inches; July 11, .[illegible] inches; July 15, .56 inches. Total, July 1 to 15, 2 inches.

The cutting of the cereal plats was finished July 1 with the exception of the smut-experiment plats sown for Mr. Reddy. On account of notes not being previously taken these were not cut until July 11 and 12. Thrashing of the barley plats began July 7. All of the barley plats and most of the oat plats were finished by the 15th.

NEW YORK

Cornell Experiment Station, Ithaca. (H. H. Love). July 15. Owing to the extreme heat of the early summer, wheat ripened much earlier than usual and wheat harvest was very largely completed by the 20th of July. In the wheat section of the State, which is in the western part of the State, wheat in general was very good. In some localities, severe storms had caused considerable lodging. There was considerable fly injury and also some rust. Wheat midge was reported also to be abundant in many sections.

Dr. C. E. Leighty , of the Cereal Office, spent the early part of the month at Ithaca going over the wheat work which included a comparison of many of his new hybrids. He also accompanied Dr. F. P. Bussell on a trip to the rye section in the eastern part of the State to harvest some rye breeding plats. During the week of July 14, Drs. F. P. Bussell and H. H. Love harvested cooperative wheat breeding plats and inspected some fields of our selection of Dawson's Golden Chaff, which is now being distributed rather rapidly.

MISSOURI

State Experiment Station, Columbia. (L. J. Stadler). No report.

IOWA

State Experiment Station, Ames. (L. C. Burnett). July 13. The weather so far this month has been extremely hot with showers at night.

All the winter wheat and 20 per cent of the oats are harvested. Most of the corn was laid by on July 5.

July 20. Practically all small grain is in the shock. Thrashing has been started in the neighborhood and yields of 30 bushels of oats per acre are being

obtained.

We will start thrashing the station plats early in the week. We have 1 1/2 days cutting to do.

GREAT PLAINS AREA (South to North)

TEXAS

Amarillo Cereal Field Station, Amarillo. (John F. Ross) No report.

OKLAHOMA

Woodward Field Station, Woodward. (John B. Sieglinger) July 15. The first half of July was rather warm and dry. Sorghums and broomcorn were beginning to wilt during the hot part of the day. The work has been counting stands and hoeing out weeds which could not be destroyed by cultivavion. The sixth date-of-seeding plats emerged to stands on July 4. A few heads are appearing in the earlier date plats. In spite of the dry weather the sorghums and broomcorn have made good growth and are at present looking good. From reports by farmers the wheat crop seems to be rather disappointing as the yield is about one-half or one-third of what they expected.

A rain of 0.72 inches on July 14 broke a three weeks dry spell which began to look serious. The maximum temperature from the thermograph was 100° on July 11, the minimum temperature was 67° on several days. The precipitation was 0.72 inches on July 14.

KANSAS

Fort Hays Branch Station, Hays. (A. F. Swanson) July 15. The weather during a period from June 13 to July 12 was characterized by high temperature and entire lack of rainfall. Since July 13, 1-2 inches of rain has fallen which has greatly benefitted all growing crops.

Two-thirds of the harvest of this vicinity is now completed. Some disappointment is expressed in that the wheat did not fill as well as expected and farmers have cut their first estimated yields. The reason for shriveled grain is rather hard to determine except a few days previous to ripening there was a lack of moisture with high temperature. Leaf rust was another probable factor. Some fields of wheat at the station have lodged badly and in nearly all fields that have not been harvested, the straw is breaking over, due to over ripeness and recent rains.

All corn and sorghums are now doing well. Some of the earlier varieties of corn are just beginning to tassel.

Harvest labor has been extremely scarce but the situation is now much improved. Many farmers have been paying $10 a day per man for their labor.

State Experiment Station, Manhattan. (John H. Parker) July 15. Harvest in the small grain nursery was finished early in the month, including wheat, oats, barley, and rye. Flax is mature now and will be harvested this week. Thrashing is in progress and will be completed early in August. The quality of the grain is

poor; all of it is dull in appearance and light in weight. This is due to the wet weather preceding harvest, and to lodging. Sorghums and corn have been thinned and corn is tasseling.

The weather during the first half of the month has been for the most part hot and dry, the total precipitation being 1.45 inches. Maximum temperatures of 100° or more have been recorded on five days. More rain is needed in order to prevent injury to sorghum and corn.

Harvesting in the rust nursery has been completed also, and differences in rust infection on the spring wheat varieties were very sharp. Several of the Durum wheats, particularly Bolley's Durums and Kubanka 2094, were practically rust free, while the Bluestem averaged 90 per cent rusted. Kota carried only a slight amount of rust and was much more resistant than other common wheats.

The harvesting of the large hybrid F.2 generation being grown in the greenhouse has also been completed and Mr. Sarkis Boshnakian, formerly on cereal rust survey, is taking notes on the plants and will analyze the data and prepare seed for making F3 sowings.

Thrashing returns from over the State are somewhat disappointing, both as to yield a nd quality of grain. A movement has been started by farmers and others looking toward the securing of better prices than those authorized by the Grain Corporation for the lower grades of wheat. Probably half or more of the crop will grade lower than No. 2, much of it perhaps as low as No. 3 and No. 4, largely because of the low weight per bushel.

CEREAL DISEASES IN KANSAS, July 15, 1919.
(L. E. Melchers)

During the past two weeks weather conditions have not been favorable for further development of cereal diseases. Stem rust in the southern counties was more severe than in other parts of the State, reaching as high as 65 to 70 per cent in some fields. Reports by cereal disease survey men show that the Kanred has shown less stem rust than any other variety being grown commercially. Many reports are reaching the station pathologist that seed is slightly shriveled and light in weight in many sections of the state. For the most part this is not due to rust, although in some cases this factor has entered into this to a slight extent.

There is perhaps as much bunt in wheat, taking the State as a whole, in the present crop as there was in 1918. This, however, is rather small in comparison to the acreage of wheat grown. Seed treatment last fall was quite successfully used by many growers.

The dry formaldehyde treatment for oat smut has given very satisfactory results in this State, but this method is not being recommended for wheat.

Corn smut began to appear about July 8 in the vicinity of Manhattan. There is no way of estimating the amount of corn smut that may be expected, although repeated observations seem to indicate that the drier the season, the more corn smut develops.

COLORADO

Akron Experiment Farm, Akron. (F. A. Coffman) July 16. The first half of July has been a rather busy time at Akron. Harvest of Cereal Investigations crops started July 7. On July 15, all of the field plats of barley, 40 field plats of oats and 4 field plats of spring wheat had been harvested. The quality of all spring cereals is much better this year, on Akron Station, than during 1917 or 1918.

In the nursery experiments 21 plats of oats and barley have been harvested. I have been doing the harvesting of these plats with a hand sicle. It is very likely that practically all of the nursery barley and oats will be harvested within the present week.

Harvest in the country surrounding the station is in full blast. Before the end of the present week the larger part of the crop will be headed. The fall wheat crop is much better in this locality this year than it was in 1918. Some fields are estimated to yield better than 20 bushels to the acre. Combined harvesters and thrashers seem to be gaining in favor in this section of Colorado. Auto trucks are also gaining favor as a means of delivering the wheat to the elevators from the farms.

The crop of corn in this part of the state promises to be the largest ever produced. Corn is just starting to tassel. Sorgo is growing well and will soon be heading.

During the first few days of the month considerable moisture was received, while the past week has been very hot and dry. A temperature of 102 being recorded July 11.

WYOMING

Cheyenne Experiment Farm, Archer. (A. L. Nelson) July 17. The first three days of July furnished 1.23 inches of precipitation which was much needed by the crops. Since that time the weather has continued dry. This rain greatly benefited the winter wheat which will produce an average yield of about 15 bushels an acre. It was also of great benefit to other crops, and sprouted much of the seed which did not germinate at the time of seeding.

Winter wheat is ripening and will be ready to harvest in about ten days. Most of the spring grains are in head and Prelude is in the dough stage. The seedings of April 15 of Kherson oats and Russian flax are showing the first signs of ripening.

The work at the station has consisted mostly of various weeding operations. A special campaign is being conducted against the Canadian thistle which gained a considerable hold last year.

Sheridan Field Station, Sheridan. (Leroy D. Miller) July 5. The weather for the past week as shown by data collected was as follows:-

Max. 107 mean max. 91; minimum 54, mean minimum 60; evaporation 2.216 inches; average wind velocity 5.3 miles; and precipitation .39 inches.

The June just past, with a mean temperature of 70.3° for the month, was the hottest on record, normal being 58.4° and the hottest June ever before recorded being 68.2°. The hottest day ever recorded in Sheridan County also occurred this month with 107° at the station, the hottest ever before recorded being 101°. During the month there were four successive days, the 26th, 27th, 28th, and 29th, when the temperatures were all above 101°, and seven days when the temperatures were 100° or above. The June precipitation was 1.12 inches, as compared with 2.07 inches as normal. The precipitation from January 1 to July 1 was 3.75 inches, while normally it should have been 9.64 inches, leaving us a shortage of 5.89 inches. Never before has there been recorded less precipitation during these six months.

As a result of this extremely hot and dry weather, spring wheat will not make a paying crop by any means, but is not so badly burned but what it will have to be harvested, none of it being high enough to harvest successfully with a binder. The same is also true of oats and barley.

Flax varieties were so thin that they were smothered by weeds. These plats were disked under on the 30th of June.

Winter wheat is going to make a crop, and on a good many plats a paying crop, although it is believed that the moisture supply is just about exhausted, and we expect it to shrivel badly. A good share of it can be harvested with a binder successfully. Winter rye is also going to make a fair crop.

July 19. The weather for the past week as shown by data collected was as follows:

Maximum 104, mean maximum 93; minimum 55, mean minimum 58; evaporation 2.444 in.; average wind velocity 4.9 miles; and precipitation .24 inches.

The annual picnic on the station, given by the Sheridan County Picnic Association, which is composed of the Sheridan Commercial Club and the Sheridan County Farm Bureau, was given on the 17th, with an attendance of over 3,000, and a temperature of 104° and a rather severe wind. Even with these adverse conditions of the day, the people were very well pleased with the days outing, and no accident of any kind was reported.

There will be but six winter wheat plats, which are November 1st seeding, left standing this noon. All others are in the shock, and many of them have not shriveled. All other crops, with the possible exception of winter rye, are pretty sick looking, and the most of them can be thought of in the light of failures. However, we are harvesting the best of them.

The rain reported above was a detriment to small grains as it caused them to dry out a little too fast.

Field pease and millet varieties had died the fore part of the week, so were turned under with a plow to get rid of the numerous weeds that were found on these plats.

John Martin, of the Cereal Office, visited the station on the 16th and inspected the Cereal project.

SOUTH DAKOTA

Crops in northeastern Wyoming and western South Dakota are very poor. The drought has been very severe and the temperatures unusually high. Spring grain on dry land is a partial or complete failure but winter wheat is somewhat better. The weather has been too hot for good growth of grain on irrigated land, and in many fields the stand is thin, owing to dry soil at seeding time. Irrigation water is scarce around Sheridan, Wyoming, and crops are suffering. Grain on the Bellefourche project in South Dakota has been irrigated three or four times but has not had sufficient water. In normal seasons two, or rarely three, irrigations are necessary. Many wheat fields on the project will yield less than 10 bushels per acre. Nearly all of the wheat grown in this district is Marquis or Kubanka.

Bellefourche Experiment Farm, Newell. (A. D. Ellison) July 22. Cereal varieties growing on dry land are practically a failure this year on account of the long period of dry, hot weather. Spring wheat varieties growing on fallowed land, however, are maturing fair stands. Early-maturing varieties of spring wheat, oats, barley, and nursery selections growing on dry land have been harvested. Cereal varieties growing under irrigation are maturing good, uniform stands. Harvesting of the earlier varieties of spring oats and barley began on July 18. A good stand of flax has been obtained under irrigation. The flax varieties are past fifty per cent ripe.

Maximum temperature for the first half of July was 100° on July 1 and 6; minimum, 49° on July 7; precipitation 0.61 of an inch.

The First Boys Encampment was held at the farm during the week of July 14-19. A daily program was followed wherein the boys received practical information and demonstrations relative to good farm practice. Sixty-seven boys were in attendance. The 5th Annual Farm Picnic was held at the farm on July 19. A large crowd was present.

Mr. John H. Martin, of the Office of Cereal Investigations, Washington, D. C., is inspecting cereal experiments at the farm this week.

Brookings. (Manley Champlin) No report.

Cottonwood Substation. (Manley Champlin) No report.

Eureka Substation. (Manley Champlin) No report.

Highmore Substation. (E. S. McFadden) A total precipitation of 2.31 inches between July 2nd and 4th, with continued cool weather, has improved crop conditions considerably in this locality.

Early oats and barley are ripening slowly while later varieties are well filled. Winter wheat and rye will be ready for harvest in a few days. Barley harvest started in the nursery July 5th with the ripening of several varieties of beardless barley.

Considerable red rust is showing up on both winter and spring wheat, but no black rust has appeared. Crop conditions in general are far above normal in this locality.

Vivian. (Manley Champlin) No report.

NORTH DAKOTA

State Experiment Station, Agricultural College. (Theodore Stca) No report.

Northern Great Plains Field Station, Mandan. (J. C. Brinsmade, Jr.) July 16. The first half of July has been very warm and dry. Maximum temperature was 96°, recorded July 3; minimum 50° recorded July 9, 10, and 15. Precipitation .06 recorded July 14.

Sixty Day oats were harvested yesterday and four other varieties of oats are ripening. White Smyrna barley is ripe and other varieties of barley are nearly ripe. Marquis, Acme, and Kubanka wheats are turning brown but do not appear to be filling very well. In the spring wheat nursery, all the heads of Khapli emmer have been eaten off by gophers though White Spring emmer and the wheat varieties are apparently untouched. Prelude wheat is ready to harvest.

The April 15 and May 1 sowings of the date-of-seeding experiment are beginning to ripen. Most of the later sown flax in the regular plat plantings is in full bloom, and the flax hybrid plantings sown as late as June 17, are coming into bloom very rapidly.

Mr. C. W. Warburton is here today.

Dickinson Substation. (Ralph W. Smith) July 15. The hot, dry weather of June has continued thus far in July with only a trace of precipitation. There have been several cool nights and the maximum temperatures were not quite so high as in June. Several hot winds early this month have helped to lower the possible yields and in some cases to eliminate any possible yields.

There will be comparatively little grain thrashed in this country this year and conditions are similar in adjoining counties. Many fields of grain are being pastured and others are being cut for hay, both hay and pasture being very scarce and much in demand. Wheat hay is selling in town for $15.00 a ton.

The question of feed to carry stock over winter is uppermost just now, and yesterday a meeting of county agents and representative farmers from several of the slope counties met in Dickinson to devise ways and means of obtaining feed from other sections favored with rain. The question of obtaining funds with which to buy feed is a difficult one, as many of the counties are bonded heavily, due to previous crop failures, and local banks are already loaded with loans. It will be necessary to ship out of the country a great deal of stock; and a majority of those present at the meeting favored disposing of the horses not needed in farming operations, also marketable beef animals, and obtaining feed enough to winter milk cows and the best heifers.

Crop yields at the substation will be very light but it is hoped that yields may be obtained from practically all plats and the nursery. Some of the increase plats will be cut for hay. Early oat varieties, winter wheat, Prelude wheat, and Gatami barley are ripe and will be harvested tomorrow.

The annual substation picnic will be held here July 18. The county agents from the slope counties are expected here July 17. Mr. Warburton is expected July 17 and 18.

MONTANA

Judith Basin Substation, Moccasin. (P. V. Cardon). July so far has brought us .75 of an inch of rain -- enough to revive many of our long suffering crops, but whether enough to help them much toward a normal maturity remains to be seen. April, May, and June combined brought only 1,98 inches, most of it in the form of useless showers, and as a result the crops throughout this region were in a very serious condition by the end of last month. The situation was relieved somewhat on the 29th of June when we got .27 inches, followed by .13 inches on the 30th, and a total of .75 inches on the first three days of this month, making a total of 1.15 inches for this week. Even that wet spell came too late, however, to benefit a large acreage in the Basin. Some winter wheat had already burned, some had been cut for hay, and the rest of it was wobbling on the brink of failure. There is still some doubt as to whether much of the latter will fill well, but there are a few patches here and there which doubtless will pay, provided we get anywhere near a normal rainfall for July.

As for the spring grain, which includes more than half of the total grain acreage of the Basin , it is impossible to state with any assurance what is going to happen. For some time past, the plants have been sending up single heads -- short heads which stand only a few inches from the ground -- and an increasing lack of vigor was becoming more apparent with the passing of each hot, dry day. Now the fields are a better color and a little growth has been made. If what rain we have had may be taken as a forerunner of a wet July, there is still hope for a good part of the spring stuff; but if the high wind now blowing from the south means more of the kind of weather we had in April, May, and June, then the recent rains may serve only to prolong our fears.

Some farmers have already given up all hope; many others have prepared themselves for the worst; but a few continue to believe confidently that the Judith Basin will yet yield a fair crop. Just what that belief is based on, I do not know -- certainly not on the season we have had so far. Perhpas it is based on the undying faith that burns in the hearts of those old-timers who have seen the Basin pass triumphantly through many a crisis in the past. Indeed, one is sorely tempted to yield to that faith when, in the face of such a trying season, one sees crops, rooted in a woefully shallow soil, enduring day after day, and week after week, and still giving promise of yielding something, when in most regions they would have been dead long ago.

Generally speaking, the morale of the farmers is beyond anything that could be expected under such conditions. Though sensing the true seriousness of the situation, they are not given up to dispair, nor are they disposed to complain. Rather it appears that they are only the more seriously considering a readjustment of their farming systems with a view of placing themselves in a better position to cope with such conditions should they come in the future. Of course, this is the first time the Basin has had to face a situation of this kind. If this were the second or third successive year of drought, the chances are that farmers here would be in much the same state of mind as is reported of many in the countries farther north. Still, I hold that the farmers right around here are among the best in the world and would not give up until they were forced to.

CROP CONDITIONS IN MONTANA AND NORTH DAKOTA
(C. W. Warburton)

Crop conditions in Montana are much worse than in 1918, the failure being much more general and more severe than that of a year ago. The report of Guy Fitzpatrick, Montana Field Agent of the Bureau of Crop Estimates, gives the condition of winter wheat on July 1st as twenty-three per cent, with indicated production of 4,025,000 bushels as compared with 11,267,000 bushels last year. The indicated yield of spring wheat, with acreage ten per cent larger than a year ago, is 11,522,000 bushels as compared with 21,197,000 bushels in 1918. Oat and barley acreages are similar to those of a year ago, but prospective yields are about half those of 1918. The flax acreage is given as 502,000 as compared with 578,000 in 1918, while the production is estimated at 2,008,000 bushels as compared with 3,641,000 bushels last year.

The best dry land grain crops this year are in the northeastern part of the State in Sheridan and Valley Counties, although even there considerably less than half a normal crop will be harvested. Irrigated crops in general are fair, though wheat and other grains in some sections are not up to the usual standards because of the necessity of irrigating to germinate the seed. The first cutting of alfalfa was heavy, but later cuttings will be reduced because of shortage of irrigation water. Streams are all very low and water for irrigation and for stock is scarce. Heavy shipments of stock are being made because of the shortage of feed and water. Large numbers of sheep are being shipped to pasture in northern Minnesota, Wisconsin, and Michigan, but cattle for the most part are going to market. Many farmers are leaving their farms to find work in other sections, but most of these men will return if conditions next spring are favorable. A special session of the Legislature to consider relief measures has been called for July 29.

Conditions in North Dakota vary greatly, crop prospects ranging from good in the eastern part of the State to total failures in the southwestern portion. Some injury has been done by drouth and hot winds in the northwestern counties, but crop prospects there are much better than a year ago. The yields of rye will be small, largely because hot weather during the latter half of May killed all except the main shoots. Wheat and other spring crops are much more promising than rye. In the eastern half of the State, rain has been abundant, and in some sections crops have been damaged by too frequent and too heavy rainfall. The southwestern portion of the State is similar to much of Montana, crops and range having been destroyed by drouth, extreme heat, grasshoppers, cut worms and wire worms. The movement of livestock out of the southwestern counties is quite general.

The July 1 crop report issued by A. J. Surratt, State Field Agent for the Bureau of Crop Estimates, shows an indicated yield of 86,918,000 bushels of spring wheat as compared with an estimate a year ago of 101,010,000 bushels. The acreage this year is about six per cent smaller than that of a year ago. The oat acreage is slightly larger than that of 1918 and the prospective yield considerably higher. The barley acreage shows a slight decrease with an estimated decrease in production of about 2,000,000 bushels. The estimated production of rye is 24,857,000 bushels as against 20,422,000 bushels last year. Estimated production of flax is 6,720,000 bushels, slightly less than that of a year ago. The condition of the corn crop over the eastern half of the State is probably the best ever known and a yield of 11,778,000 bushels is predicted as compared with 9,196,000 bushels last year.

The results from rye in western North Dakota this year have been generally unsatisfactory and it seems probable that there will be a marked decrease in the acreage sown next fall. The rye crop is generally held responsible for the prevalence of grasshoppers, as rye is usually sown in wheat and other grain stubble and these stubble fields are the best of breeding grounds for this pest. The enormous increase in the rye acreage in North Dakota during the war period was due to the high price of rye as compared with other grains, the fact that little labor was required to produce a crop and though the fall-sown crop was considerably increased, the cultivated acreage could be handled by the given equipment. With the return to normal relations between rye and wheat prices, the rye acreage is likely to decline though this crop will continue to be grown with profit on all plowed land.

WESTERN BASIN AND COAST AREAS (South to North and West)

UTAH

Nephi Substation, Nephi. (Aaron F. Bracken) No report.

IDAHO

Aberdeen Substation, Aberdeen. (L. C. Aicher) No report.

OREGON

Harney Branch Station, Burns. (Obil Shattuck). June 30. With regard to frost resistance the main crops run about as follows:-

Spring Wheat:-- Galgalos, Koola, Little Club, Bobs, Marquis, Baart, Prelude, Dicklow, Aulieata, Chule. Of the new varieties on trial, Golden Ball and Federation C. I. 4734 stodd up best.

Spring Oats:-- Rustless sel., Sixty-day, Neb. No. 21, Silvermine, Big 4, Swedish sel., Shadeland Climax.

Spring Barley:-- White Smyrna, Hannchen, Trebi.

The acre of Advance rye that was cut on account of the frost is now up and fully headed with practically as heavy a stand as the original.

All varieties of wheat, oats, barley and rye are heading out, but most of the varieties were only six to ten inches tall when heading began, due to the extremely dry conditions. All of the cereal crops growing under dry-land conditions on the station are suffering from lack of moisture. This condition is also true of the surrounding country.

Alfalfa cut immediately after the severe frost of May 31, is starting to bloom and will be ready to harvest in about two weeks, while that cut about ten days later will hardly be worth harvesting.

The spring rye C. I. 26101 still continues to be the most promising cereal crop on the station.

On the irrigated section of the station the alfalfa, spring rye and sugar beets are the crops showing the most promise.

There has been no precipitation on the station during the month of June. The Max. temperature 92° on the 19th and 25th; minimum, 21° on the 1st.

The grasshoppers are still quite numerous in various sections of the county and are moving in on the station to some extent, notwithstanding the fact that over 4,625 pounds of poisoned bran have been used on the cereals.

The sage rats are more numerous than they have been for several years, and as the station is practically surfounded with uncultivated land it is impossible to prevent considerable damage by this pest.

July 19. On the 7th of July, the thermometer registered 29°, and on July 8 and 9 registered 97° and 100°, respectively, with the result that the cereals burned badly. All varieties are fairly well filled and some will mature tho the lack of moisture will materially reduce all yields.

President Kerr and the Board of Regents:- Messrs. Weatherford, Pierce, Myers, Cornwall, Von Derwellen and Woodworth inspected the station July 14.

The Sixty-Day oats are beginning to ripen and the second crop of alfalfa is being harvested.

9
6917

CEREAL COURIER

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

- -

Vol. 11. August 10, 1919, No. 12
Field Station Issue (July 16-31).

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North).

LOUISIANA

Crowley Rice Station, Crowley. (J. Mitchell Jenkins). The maximum temperature for the half month was 93° on the 16th and 17th; minimum temperature, 72° on the 26th. The total precipitation was 5.86 inches, reaching the greatest point on the 26th, 1.93 inches.

The heavy rains during the last two weeks of July resulted in the destruction of late-seeded soybeans, and greatly retarded cultivation of older crops. Rice is growing well, but heavy rains during last winter distributed weed seed, resulting in rather weedy plats. These weeds are being removed as rapidly as weather conditions will permit. In one field it is impossible to remove them without great damage to rice.

GEORGIA

State Experiment Station (Athens) and Substations. (R. R. Childs). Threshing has all been completed, and we are now engaged in cleaning and grading all grain. Acre yields of wheat were as follows:--

Variety	Bushels
Bluestem, 600-1	37.3
Fultz	36.9
Red May	36.7
Dietz Mediterranean	35.5
Fulcaster, 2980	36.5
Bearded Purple Straw, 700-33	35.4
Currell X Dietz, 547 A1.	35.2
Acme, 3115-2	35.0
Mammoth Red, 3008	35.0
Leap Prolific	34.8
Bearded Purple straw, 700	34.4
Fulcaster, 500-2	34.2
Georgia Red, 650-32	33.8
Dawson Golden Chaff, 1733-3	33.8

Australian	33.4
Fulcaster, 500	30.0
Georgia Red, 650	30.0
Fishhead, 1732	27.9
Durum	27.5

Attention is called to Fulcaster 500-2 and Georgia Red 650-32 which are pure line selections and yielded, respectively, 34.2 bushels a nd 33.8 bushels as compared with 30.0 bushels for each of the original unselected strains.

The plats of wheat sown on different dates also showed quite a difference in yield.

Fulcaster, October 15.	44.4 bushels per acre.
" , November 15.	12.5 " " "
Georgia Red, October 15.	43.75 " " "
" " , November 15.	17.9 " " "

The yields of all varieties of oats and barley were very low, due to winter killing.

TENNESSEE

State Experiment Station, Knoxville. (C. A. Mooers). No report.

NORTH CAROLINA

State Experiment Station, West Raleigh. (G. M. Garren). No report.

VIRGINIA

Arlington Farm, Roslyn. (C. E. Leighty). The maximum temperature for the last half of July was 95° on July 27; minimum, 68 July 17.

Rainfall has been as follows:- July 16, .14 in.; July 18, .90 in.; July 19, 1.58 in.; July 21, 1.64 in.; July 22, 1.09 in.; July 23, .70 in.; Total:- 6.05 inches Total for first 28 days of July, 8.05 inches.

Rain prevented field work for at least 10 days in this period. The days on which rain did not occur were foggy and damp, so that threshing could not be done. As a consequence, much of the grain in the field left without covers is badly sprouted and damaged.

The thrashing of the nursery wheat was finished on the 26th. Thrashing of the barley nursery began on the 28th. Thrashing of the wheat plats is now in progress. The quality of wheat this year is only fair. There are many small, poorly-developed and shriveled kernels. The weight per bushel ranges between 50 and 60 pounds, with the average about 56 pounds. Only one plat so far thrashed has weighed as much as 60 pounds per bushel. Several of the varieties are yielding above 30 bushels per acre. One increase plat of Purple Straw, C. I. 1915, 1 7/40 acres in size, yielded at the rate of 31.5 bushels per acre. This plat wa s sown on October 21 with seed that had been given the hot water treatment for loose smut.

NEW YORK

Cornell Experiment Station, Ithaca. (H. H. Love). At Ithaca the wheat and rye harvest was completed the week of July 14. Barley was harvested July 24 and 25; and the oat nursery harvest was completed July 31. The drill plats and increase plats will be harvested August 2. Dr. Bussell is harvesting some cooperative oat plats in the eastern part of the State, but, owing to the very wet weather in the early spring, some of our cooperative breeding plats will not be harvested until after the middle of August.

Considerable wheat has already been threshed and oat harvest on the farms is now beginning. The crop will be very light, owing to the late sowing and an unusually dry, hot June.

In the hybrid nursery all the wheat is harvested and most of the barley and part of the oats. A good many thousand hybrid oat plants remain yet to be harvested, particularly those which are being used for the study of color and inheritance of ligule.

Reed Brothers, with whom we are cooperating in oat improvement, visited the breeding experiments this last week, as also did Mr. W. W. Minard of Poplar Ridge.

MISSOURI

State Experiment Station, Columbia. (L. J. Stadler). No report.

IOWA

State Experiment Station, Ames. (L. C. Burnett). Corn suffered from the effects of dry, hot winds July 25 to 27, inclusive. Thrashing has started. Winter wheat is yielding from 25 to 35 bushels per acre, and oats from 30 to 50 bushels per acre. On the station winter wheat yields are from 35 to 40 bushels per acre, while oats are low in yield and poor in quality.

GREAT PLAINS AREA (South to North)

TEXAS

Amarillo Cereal Field Station, Amarillo. (John F. Ross) (July) I was too busy in the field the last of June and first of July to write a report of conditions at that time. The same is true of the middle of July.

(June) The weather data for June is as follows: Maximum temperature 91° on the 8th; minimum 38° on the 1st and 2nd; average hourly wind velocity 5.7 miles; precipitation 3.53 inches, the heavy showers of which came as follows:-- 1.75 inches on the 9th, .59 inches on the 11th, and .50 inches on the 24th - with the smaller showers pretty well scattered; and evaporation 7.3 inches.

The weather data for July is as follows:- Maximum temperature 97° on the 11th and 12th; minimum 53° on the 3rd; average hourly wind velocity 7.9 miles; precipitation 2.39 inches, the bulk of which came on the 17th (1.78 inches); and evaporation 8.497 inches.

The small grains were considerably damaged by rust, both leaf and stem rust, shortly before harvest. All small grains were harvested the fore part of the month in fairly good shape, though they ripened very rapidly after once starting, and some began to fall before the harvesting was completed.

Help has been very scarce since the harvest began and we have had a hard fight with the weeds. No threshing has been done at the station yet. Row crops are looking fine and are heading fast now.

On the 21st, the J. I. Case people were at the station demonstrating a new two-row lister. This lister was drawn by a Cleveland Tractor. On the 26th, the Tri-State Tractor & Implement Company people were at the station demonstrating a Fordson Tractor pulling a gang of two 14" moldboard plows. Advantage was taken of these implements while on the station, and as a result, 12 acres of weedy ground was plowed.

OKLAHOMA

Woodward Field Station, Woodward. (John B. Sieglinger) This July has been drier than average, as the only precipitation was from July 14 to 18, when a total of 1.35 inches of rain fell.

Thinning of the last date-of-seeding plats was done on the 26th, so all of the thinning is completed for this year. Counting of the stands of plants is practically done.

The last week some crossing of the sorghums has been attempted, but as yet one cannot be sure if they are successful. The weather has been rather bad for hybridizing because of the heat and dryness.

Sorghums and broomcorn are heading rapidly and a good rain would almost insure a good yield. Feterita, C. I. No. 182, and Freed sorgo, in the varietal experiment, were all headed on July 28 and 29, respectively. The first date-of-seeding plat of broomcorn will be ready to harvest in another week. Standard broomcorn, C. I. No. 580, is all headed today and looks as if it would make a fair yield, the remainder of the broomcorn of the varietal experiment will need rain to make good yields as most of the varieties are in the boot and are wilting badly during the heat of the day.

Wheat threshing is going ahead rapidly and the yields I have heard of run from 2 to 22 bushels to the acre. The straw is very heavy.

The maximum temperature for the month was 100° on July 11, and the minimum was 54° on July 25. The daily precipitation for July was, July 14, 0.72 inches; July 15, 0.07 inches; July 16, 0.23 inches; July 17, 0.03 inches; and July 18, 0.30 inches; a total of 1.35 inches for the month.

KANSAS

Fort Hays Branch Station, Hays. (A. F. Swanson) No rain has fallen since July 13 and 15, when the total precipitation was 1.2 inches. Since July 25, the thermometer has registered from 100° to 103°. The wind velocity has been high. Today we are having cooler weather and rain is threatened.

Threshing has begun in general in this vicinity. It is doubtful if any No. 1 wheat will be turned out. Bushel weights range from 49 to 56 pounds. A few fields have averaged 25 bushels but the common average is from 13 to 15 bushels per acre. Threshing on the Cereal Project will begin Monday. Some delay was caused because of lack of power.

Some fall plowing is being done for the next year's crop. A number of farmers report that because of the heavy stubble, they will burn it and seed the wheat without further preparation of the soil. The summer fallow on the Cereal Project is in excellent dondition.

All sorghums have made good growth, altho the kafirs during the last week seem to be at a standstill. Only two local selections of dwarf blackhull and white kafirs have headed.

Three local selections of Feterita and C. I. No. 182 from Woodward have been headed since July 21. Spur Feterita is just heading and is showing a good leafy growth. Freed sorgo, the kaoliangs, a dwarf milo and the sweet sorghums are progressing very nicely and have headed.

Of the corn, Minn. No. 13, and Sherrod's white dent are in the roasting-ear stage and are beyond the danger point in case of immediate rains. Other varieties, as the Pride of Saline, Reid's Yellow Dent, Iowa Silvermine, were pollinating during the period of high temperature. The effects of the heat will be noted.

State Experiment Station. Manhattan. (John H. Parker) The weather data for July is as follows:— Mean temperature for the month 80.9°, maximum temperature 105° on July 11, minimum 52° on July 22; total rainfall 1.45 inches. Rain fell on July 4, 6, and 14, and there was none on any other dates. There were thirteen days on which the maximum temperature was 100° or higher. This hot dry weather has already resulted in some injury to corn, and has caused the sorghums to make only a slow growth, the injury to corn has not been as severe as it would have been had the high temperature been accompanied by hot winds.

Threshing of small grains has been completed both at the Agronomy Farm and in the Nursery, and the grain is now being cleaned and tested for weight per bushel. A number of third generation hybrids between beardless winter wheat and Kanred are being studied for Mendelian ratios. The awnless segregates will be further tested for yield and grain quality. Mr. Boshnakian is at work on the series of second generation hybrids between spring and winter wheats. The notes are completed and threshing and seed counting are in progress.

A rather large number of varieties and strains of winter wheat , which have been grown in the nursery for a number of years will be discarded so as to make room for handling strains coming up from head rows and for hybrid progenies.

A large number of late maturing strains of Red Oats also have been discarded and a rather large number of pure line selections, which were in head rows this season, will be grown in the nursery in 1920. Iowa 103 and Iowa 105, Sixty-Day types, have outyielded other varieties of early white oats and probably will replace them in parts of the State where these varieties are adapted. The highest yielding variety at the Agronomy Farm and in the nursery is Kansas 5179, known as Fulghum. This variety has outyielded all others for several years and was given preliminary tests this year with farmers in five counties in different parts of the State. In all these tests it outyielded the other varieties. It will be further tested throughout the oat-growing sections of the State in 1920.

Mr. Parker spent the week of July 27 to August 3 at Ames, Iowa; St. Paul, Minnesota; and Fargo and Mandan, North Dakota, in becoming familiar with the cereal breeding in progress with particular reference to breeding for winter hardiness and disease resistance in wheat.

COLORADO

Akron Experiment Farm, Akron. (F. A. Coffman) Harvest was practically completed in northeastern Colorado by July 31. The winter wheat crop in this part of the Great Plains, tho much below what June 1 conditions indicated it might be, was larger than in either 1917 or 1918. The quality of the grain is very good, weighing 60.64 pounds per bushel at the local elevators. Conditions for harvesting were comparatively favorable. The labor shortage was not so acute as during the last two seasons, as nearly all of the men are now home from the army and the army training schools. Weather conditions during harvest were also very favorable, with very little wind or rain.

A very noticeable change is taking place in this section of the State in the method employed to deliver the wheat to the elevators. Heretofore, practically all of the wheat has been hauled by team and wagon while this year auto trucks are handling a large percent of the crop. While a few farmers have their own trucks, most of the trucks being used in hauling wheat are owned in town. Another noteworthy change is the increase in the number of combined headers and thrashers used this season in comparison with previous years.

July was exceedingly hot, dry, and windy in this immediate vicinity, and as a result, corn and other late crops have suffered severely. Hot winds, which are rather unusual for this section of the State, were experienced several times during the month. Light showers were received during the last few days of the month and the situation has been slightly relieved. If a good rain should come within the next week or ten days, a fair crop of corn might yet be produced in the section surrounding Akron Field Station. The corn in many fields is fully tasseled. Sorghum, sudan grass, pinto beans and millet also are showing the effects of the dry weather, but possibly slightly less than is the corn.

Harvest of Cereal Investigations crops was practically completed by July 31. The only field plats yet remaining to bbe harvested are those of White Tartarian oats (C. I. No. 300). As in previous years, the late cereal crops suffered considerably, due to lack of moisture, especially so on ground seeded the previous year to corn. As a whole, however, the spring grain yields are the best secured since 1915. The average acre yields of some of our spring wheat varieties will very likely be close to 20 bushels. The plats of oats and barley were injured more noticeably than were those of spring wheat. It appears that this is partially due to the soil on which these plats were located being higher and more susceptible to drought influences.

Rust, which is very uncommon on this station, was found to a considerable extent on our spring cereals. No appreciable damage seemed to result from the rust on the grain in the field plats. Considerable damage was done to the later-maturing varieties of spring wheat by the chinch bugs. This is the first season the writer has noticed these pests at Akron Field Station, in three years on the station.

Harvest of the oats and barley sections of the nursery has been completed. The late-maturing varieties of oats were considerably damaged by rabbits. In some of the head rows at least 25 per cent of the heads were eaten off.

Mr. J. A. Clark, in charge of Western Wheat Investigations, visited the station July 18. With Mr. Clark, a trip was made several miles north of the station, to inspect a field of spring rye. There are several farmers near the station growing this crip but so far spring rye has not been tried on the station.

Professor E. C. Chilcott, of the Office of Dry-Land Agriculture, visited the station July 22, 23, and 24. Accompanied by Supt. Grace, he left for Nebraska and Wyoming. Professors Ray and Meyenger of the Colorado Agricultural College, visited the station during the latter part of the month.

WYOMING

Cheyenne Experiment Farm, Archer. (A. L. Nelson) The month of July has been the most propitious crop-producing month this year. During the first three days we received 1.23 inches of rain, and a total of 2.76 inches of precipitation for the entire month. These rains caused the sprouting of seed which had lain in the ground since seeding in the spring. On July 9, the temperature reached 96°, the highest maximum in 30 years. The minimum was 47° on July 18. The wind velocity ranged between 3.0 and 7.6 miles per hour over a period of 24 hours.

The winter wheat was greatly improved by the early July rains and the average yield will be about 12 to 15 bushels per acre. That seeded on disked oat stubble will about equal the yields produced on fallow land. A week of misty, damp weather the last of July prevented the harvesting of winter grains, which will begin August 5.

The spring grains are showing the first signs of ripening. While the stand is relatively thin the grain should, in most cases, be of fair quality. Rust has become very pronounced on some varieties. This has been favored by the generally high humidity during the past month.

A large acreage of small cereals was seeded in this region but only a small portion will be harvested, due to scant rainfall during the spring months. There has been an improvement in forage crops such as corn and millet. The ranges have been greatly improved but the grass will not make sufficient growth to provide winter grazing. This condition is made the more serious by the short hay crop and prices are expected to reach $70.00 per ton by spring. However, a large number of fields in which seed germination did not take place until July 1 are now green and with favorable weather may produce feed.

°During the month, Messrs. J. A. Clark and Stanton, of Cereal Investigations, and Chilcott, Stephens, and Grace, of Dry-Land Agriculture, were visitors at the station.

Sheridan Field Station, Sheridan. (Leroy D. Milley) (August 2) All crops in the Cereal Fields that will be harvested this season are now in the shock or threshed. Nearly all of the spring wheat varieties were harvested, but only a portion of the barley and oats, and the rates and dates of seeding of wheat, oats, and barley could be harvested at all. None of those spring crops that were harvested were cut because it was thought it would be a paying proposition, but because we wanted to see what results could be gotten under the trying conditions of this year.

We have threshed all of the spring wheat varieties that were harvested, and the highest yield obtained was 2 bushels. We have threshed some of the spring and winter wheat from rotations that went 7.0 and 11.7 bushels, respectively, on summer-tilled land. We feel certain that there is still some better winter wheat to thresh on the varieties and rates and dates. A rain last night put a stop to threshing for a few days.

This was the hottest July on record at Sheridan. We are also 5.96 inches short on our normal precipitation. We have had only 4.52 inches of precipitation this year, the normal being 10.48 to August 1.

The first date of seeding of winter wheat was seeded on July 31. Enough of all varieties of winter wheat was given the formalin treatment to do the fall seeding.

SOUTH DAKOTA

Bellefourche Experiment Farm, Newell. (A. D. Ellison) No report.

Cotttonwood Substation. (Manley Champlin). Most of the small grain plots are harvested and threshing will commence soon. The picnic on July 16 was successful and it was voted to make it an annual affair. Grain yields promise to be fairly good and there is little trouble with disease in the crops.

Highmore Substation. (E. S. McFadden) Harvest is about completed on the Highmore station and oat threshing has started. Early oats are yielding from 40 to 60 bushels per acre. None of the late varieties have been threshed. Wheat yields will be reduced considerably as a result of epidemics of both leaf and stem rust. The following varieties grown in field plats were remarkably free from both

leaf and stem rust: Kanred, Monad, D5, and Acme. C. I. No. 3780, grown in rod rows in the nursery, was entirely free from stem rust. Two selections from Iumillo were also practically free from stem rust. Several promising rust-resistant plants appeared this year in an F_3 mixed population of Acme x Marquis. The most promising of these were selected for growing in head-rows next year.

Grasshoppers are quite numerous on the station and did considerable damage to late grain on high ground. Poison bait was tried but the hoppers did not seem to touch it as long as they could get green feed. On July 20, following a light shower, there was a general migration of enormous numbers of young toads from the low land to higher ground. A few hours later practically every grasshopper had been destroyed by the toads as far up on the high ground as the migration extended.

Dry, hot weather is prevailing, and corn is beginning to suffer from lack of moisture. The highest temperature recorded was on the afternoon of July 26 when the mercury reached 106° after the wind had been blowing from the northwest nearly all day. This extreme temperature came as a decided surprise, and was accompanied by the first hot wind from the northwest that I have ever experienced.

Several hundred hybrid barley selections, most of them either hull-less or awnless, have been made for head-row sowing next year. Considerable hybridizing was done this year, most of it with winter wheat, spring wheat and barley. Several attempts at hybridizing wheat and rye were made but most of them proved unsuccessful. Several F_1 wheat-rye hybrids were grown last year, but all of them were sterile. It is hoped that the hybrids grown next year can be induced to develop some seed.

Eureka Substation. (Manley Champlin). Crops are harvested and threshing would have begun, but for the delay in securing a new machine ordered several weeks ago. Grasshoppers are plentiful, but have not done serious injury to the crops. Yields promise to be better than normal for all of the small grain crops and present conditions are very favorable to corn.

Vivian. (Manley Champlin) The Cole oats are in the stack, and Odessa barley is harvested. Crops of both are excellent. If we are able to get the Odessa barley stacked before rain occurs, the seed will be of the best quality of any Odessa barley that we have ever distributed. Swedish rye has also made an excellent crop. Interesting results were secured in a test of the three crops as nurse crops for alfalfa. A good stand was secured with the Cole oats, but no stand was secured with the rye, and that resulting where the barley was sown is very poor and will not be good enough to save. Corn on the station is excellent and wheat in the vicinity of the station promises to yield from 20 to 35 bushels per acre, with very little disease in evidence.

Brookings. (Manley Champlin) Nearly all of the grain on the experimental plats has been harvested. All of the wheat is affected seriously with scab, even including the Turkey winter wheat, which usually misses the various diseases. All except Acme, Monad, and D5 are rusted. Bluestem, Preston, and Marquis show heavy infection. Corn is promising. Early oats are good and barley is just fair. While

the barley is not scabbed as bad as the wheat, the plants are relatively short and have not stooled properly so that the stands look thin.

General. The South Dakota wheat crop has been severely injured by scab and weather conditions. There will probably be not to exceed 50 per cent of the government July 1 estimate. Fields have been examined in the vicinity of Clark, Redfield, Huron, Mitchell, Vivian, Newell, Cottonwood, and at two or three other points. In the eastern third of the State, from 25 to 75 per cent of the heads are blighted in the vicinities mentioned, except that near Clark the crops seem to be much less affected than at Redfield and Huron or Mitchell. Late seeded wheat, contrary to the general rule, is better than early seeded wheat this year owing to the excessive rainfall in June. Early oats are good and late oats and barley are a fair crop. Corn is very promising at the present time.

NORTH DAKOTA.

State Experiment Station, Agricultural College. (Theodore Stoa) No report.

Northern Great Plains Field Station, Mandan. (J. C. Brinsmade, Jr.) During the last half of July there were .79 inches of rain, which, however, came too late to be of much benefit to wheat, oats, and barley, most of which had been already harvested.

All of the wheat, oats, and barley in the rotations and varietal plats have now been harvested and thrashing will begin Monday, August 4.

Flax in the first three dates of seeding is ripening and will soon be ready to cut. Flax in the varietal plats has almost finished blooming.

There have been a number of visitors to the station during the last half of July: C. W. Warburton was here July 16. Mr. and Mrs. C. M. Woodworth arrived July 17, and are here now working on flax disease and genetic studies. J. A. Clark, J. H. Martin, and E. C. Stakman were here July 28 looking over the wheat sowings. C. H. Clark, who also arrived July 28, is here now making flax genetic studies. J. H. Parker, Plant breeder of the Kansas Experiment Station, and Dr. I. E. Melhus, Pathologist of the Iowa Experiment Station, are here today.

On July 30 a very successful farmers' picnic, under the direction of Max Morgan, agricultural agent for Morton County, was held here at the station.

Maximum temperature for the last half of July was 103°, recorded July 18; minimum, 47°, recorded July 21.

Dickinson Substation. (Ralph W. Smith) The extremely dry, hot weather was relieved to some extent by a rain of 0.34 inches on July 29, followed by cooler weather. Cereal crops are too far along to be much benefitted, but corn, pasture, and garden crops will be improved. The total rainfall for the month was 0.44 inches, while that for June was 0.53 inches. The maximum temperature for July was about 103° on July 17. This was accompanied by a severe hot wind.

There is but little harvesting being done in the country, most of the grain being cut for hay or pastured. Some winter rye was harvested and some has been thrashed, but yields have not been reported.

All of the rotation plats at the Substation have been harvested except the flax, More than half of the cereal varieties in both plats and nursery have been harvested, and the greater part of that remaining will be harvested this week. Most of the grain is very light but it is hoped that some of the durum varieties may yield as much as 10 bushels per acre.

Mr. J. A. Clark and Mr. Martin arrived at the Substation July 29. Mr. Martin is taking notes and collecting herbarium specimens in the durum classification nursery. Mr. Clark left on July 30 for points in Montana. On July 17, the county agents from the slope counties of the State visited the Substation.

The annual picnic at the Substation on July 18 was fairly well attended and an interesting program was given to a very attentive audience. Among the speakers were C. W. Warburton, Director P. F. Trowbridge, Katherine Hansen, John Hagan, (Commissioner of Agriculture and Labor), and Rev. Duling of this city. The former superintendent of this station, L. R. Waldron, visited the station during the picnic and also Prof. E. J. Delwiche, Associate Professor of Agronomy from Ashland, Wisconsin.

MONTANA

Judith Basin Substation, Moccasin. (P. V. Cardon). No report.

WESTERN BASIN AND COAST AREAS (South to North and West)

UTAH

Nephi Substation, Nephi. (Aaron F. Bracken) (July) The extremely hot weather of June continued through the whole month of July. Every day brought a maximum temperature of 90° and above, with 101°, which occured on the 10th and 11th as the highest. The minimum temperature of 46° occurred on July 19. The precipitation, .54 inches, came in four small showers.

On the station all winter and spring grains were harvested and all mid-summer soil moisture samples were taken during July. On July 18, thrashing began, and at this date is half finished. Check plots of Turkey, C. I. 2998, are yielding nearly 24 bushels per acre.

IDAHO

Aberdeen Substation, Aberdeen. (L. C. Aicher) No report.

OREGON

Harney Branch Station, Burns. (Obil Shattuck) Weather conditions at the station have been extreme for the past 90 days. The precipitation for the months May, June, and July totaled .35 of an inch. The average precipitation for the past 6 years in the same period is 2.51 inches. The evaporation for the same peri d was

25.009 inches. The maximum temperature for July was 100° on the 9th and 16th; the minimum was 29° on the 7th and 18th.

All of the cereals are fully headed and most varieties have begun to ripen. The spring rye (No. 26101), Early Baart wheat, and Sixty-Day oats are about 75 per cent ripe.

The flax, winter wheat, and winter rye varieties on the dry-land are failures, due to drought and frost.

The field peas are practically a failure due to serious attacks by the red spider (Tetranchus bimaculatus).

The second crop of alfalfa has been harvested and the third crop is growing vigorously. This crop was good both on dry and irrigated plots.

On the irrigated land the alfalfa is first, spring rye (26101), second, with barley third. The half sugar mangels are doing fine and the potatoes are in good shape.

Of the barley varieties under irrigation the Trebi seems to be leading the field, with the Hannchen and White Smyrna second and third.

The grasshoppers are well under control, though a few are still in evidence. Six thousand five hundred pounds of poisoned bran were used in combatting this pest on the station.

Mr. A. Breithaupt tendered his resignation as Irrigation Assistant, effective August 1.

Sherman County Branch Station, Moro. (D. E. Stephens) Supt. Stephens has been away on a tour of inspection of field stations in Washington, Idaho, and Utah, which doubtless accounts for lack of report.

WASHINGTON

Adams Branch Experiment Station, Lind. (M. A. McCall) We are now threshing, having finished all the winter grains and the spring rate and date tests, and have started on the spring varieties. Yields are materially better than last year but are not up to the normal standard, the season having been very dry. Fortunately there has been very little hot weather and, considering the shortness of moisture, yields are good.

Winter Wheat Yields

Variety.	C. I. No.	Bu. per A.	Wt. per Bu.
Turkey	6175	13.70	59.0
Kharkov	1442	13.9	57.5

Winter Wheat Yields (continued)

Variety	C. I. No.	Bu. per A.	Wt. per Bu.
Kanred	5246	14.3	58.0
Beloglina	1147	13.2	57.5
Jones Fife	6377	15.2	55.75
Quail Fife	6362	15.5	56.25
Turkey x Jones Fife	6378	14.9	53.00
Triplet	5408	14.5	56.25
Burbank	5544	14.3	53.5
Neb. Hybrid No. 28	1438	7.0	58.25
Ghirka Winter		10.7	58.0
Ruddy		13.0	56.25
Winter Bluestem	5409	12.3	55.5
Forty Fold	4156	12.4	54.75
Early Baart	1697	10.9	60.25
Washn. Hybrid 128	4512	13.7	55.5
Washn. Hybrid 143	4513	11.3	58.75

Winter Rye Yields

Minn. No. 2	137	10.9	52.0
Local		9.0	52.0
Yellow Von Rumker	173	12.3	51.25
Local White		13.0	48.25

Winter Barley Yields

Tapps' Winter	592	10.2	34.0
Wisconsin Winter	519	10.6	42.0

Miscellaneous

Buffum Emmer	3331	15.0	
Red Winter Spelt	1772	26.2	30.0

CALIFORNIA

Plant Introduction Field Station, Chico. (V. H. Florell) No report.

Rice Field Station, Biggs. (Jenkin W. Jones) The weather has been favorable for the growth of rice during July, except for the past week, which has been cool. We have the station pretty well freed from water grass at present. All plats have been gone over twice and some of them three times. I have not had time to inspect the rice crop on the west side of the river, but this side looks fairly good, except for so much water grass.

9
6917

RECD SEP 2 1919 BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

- -

Vol. 11. August 20, 1919, No. 13.
Field Station Issue, (Aug. 1-15)

OFFICE NEWS

Notes on the personnel and other news have been conspicuous by their absence during the past two months. The need for putting first things first has compelled the omission of these and even the suspension of publication entirely at different times. Field Station reports are now up to date and the issue of August 31 will be full of human interest. Personal items covering the work of the different men and their experiences in the field will be especially welcome.

SEMI-MONTHLY REPORTS

This issue shows that many of the Station men are not furnishing reports for each half of the month, as requested in the issue of July 10. We are making a special effort to get out the Courier on time, now that the pressure of work and the size of the Office force permits. Please send reports promptly, especially from the Southern and Eastern stations, which go to press first.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley. (J. Mitchell Jenkins) During the first week of August good weather obtained, permitting most of the soybeans to be cultivated. However, heavy rains have fallen during the past week, causing much of the soybean area to be flooded for days. Many rices in nursery and increase plats are heading. We are still pulling weeds and hope to have this completed during the next week. Piricularia has done much damage to young rice.

The maximum temperature for the half month was 97° on the 8th; the minimum, 75° on the 9th and 11th. The total precipitation was 2.90 inches, reaching the greatest point (1.00 inches) on the 10th.

From August 5 to 9, a trip was made to Baton Rouge, St. Gabriel, and Donaldsonville, Louisiana, to confer with Prof. Dodson and to visit cooperators.

Rice harvest commenced during the week on the River. Good yields and good prices are reported.

Sugar cane on the River and in other sections is rather poor, due to poor cultivation caused by frequent rains in spring and summer.

Visitors to the Station on August 9 were Mr. Silverio Apostal, Chief, Plant Industry Division, Bureau of Agriculture, Manila, P. I.; and Mr. Mario F. Magalhaes, Fazenda Modelo, Piracicaba, E. Sao Paulo, Brazil.

GEORGIA

State Experiment Station (Athens) and Substations. (R. R. Childs) No report.

TENNESSEE

State Experiment Station, Knoxville. (C. A. Mooers). No report.

NORTH CAROLINA

State Experiment Station, West Raleigh. (G. M. Garren) No report.

VIRGINIA

Arlington Farm, Roslyn. (C. E. Leighty) No report.

NEW YORK

Cornell Experiment Station, Ithaca. (H. H. Love) No report.

NOTE ON OHIO AND INDIANA (C. E. Leighty)

It looks to me as if about half the wheat is still in shock out here in Ohio and Indiana, along the Pennsylvania Railway. Rains have not injured it to any extent so far as I can observe from the train.

MISSOURI

State Experiment Station, Columbia. (L. J. Stadler) No report.

IOWA

State Experiment Station, Ames. (L. C. Burnett) No report.

GREAT PLAINS AREA (South to North)

TEXAS

Amarillo Cereal Field Station, Amarillo. (John F. Ross) No report.

OKLAHOMA

Woodward Field Station, Woodward. (John B. Sieglinger) To date, August has been hot and rather dry, and at present a good rain would be as welcome as anything. The last few days, some of the kafirs have ripened quite a lot due to the dry hot weather.

The work of hybridization was completed for this season on August 11, as all the crosses were made which the outline called for. At present it looks as if many of the crosses were successful.

The first date-of-seeding plat of broomcorn was harvested August 5, and the second date and C. I. No. 580, of the varietal experiment, were harvested August 11. Next week most of the broomcorn will be ready to harvest.

On August 11, two plats of Sudan grass, a plat of millet, and a plat of sown amber cane were mowed. They were hauled in and weighed today.

English sparfows from town are bothering the date-of-seeding plats, though they are not quite so numerous as they have been other years.

The sorghums in the varietal and rate-of-seeding experiments are well headed and should make fair yields.

The maximum temperature for this month was 104° on August 15, and the minimum was 64° on August 9 and 10. The precipitation for this month was 0.16 inches on August 2, 0.78 inches on August 7, and 0.02 inches on August 8, or a total of 0.96 inches for the half month.

KANSAS

State Experiment Station, Manhattan. (John H. Parker) Weather during the first half of August continued hot and dry. There were six out of fifteen days with temperatures over 100°. The maximum was 108° on August 6; the minimum 56° on August 12 and 14. Rainfall for the period amounted to .26 inches.

Some parts of the State, particularly the west central, have had showers which have benefited the corn. In the more important corn-growing sections, however, the crop is badly in need of moisture and some injury has already resulted. Medium early varieties will make the best yields at the Station.

Sorghum varietal plats and head rows are in head, except some of the later varieties.

Fort Hays Branch Station, Hays. (A. F. Swanson) Since July 15, only .74 of an inch of rain have fallen and the weather has been marked by relatively high temperatures.

Threshing on the Cereal Project was finished on August 9. In the varietal experiments, Kanred wheat outyielded all other varieties from 6 to .5 bushels. Fulghum oat made a yield of 75.6 bushels while Burt x Sixty-Day made a yield of 56 bushels. Mariout and Stavropol barley made yields of 45.8 and 43.1 bushels, respectively. Marouani (durum) wheat, C. I. 2235, yielded 16.33 bushels per acre.

One-fourth of the thrashing is finished in this vicinity. Very little preparation so far has been made for the next wheat crop except that in a number of fields

the stubble has been burned. This practice tends to be rather general this year due to the heavy stubble.

Corn on bottom lands will make satisfactory yields. The experimental corn on the upland is suffering. Kafirs are hurt by the drought, but all other sorghums on the experimental plats are doing well.

COLORADO

Akron Experiment Farm, Akron. (F. A. Coffman) Work at Akron Field Station has progressed favorably during the half month just past. Thrashing of the C. I. project grain in field plats was completed on August 15. No damaging rains occurred at the station from the time the grain was harvested until after it was thrashed, and, as a result, the grain is clean and bright. The yields obtained are a trifle disappointing in that they are considerably below the estimates. The best-yielding varieties of the various classes and sub-classes are given herein.

It is indeed worthy of notice that Golden Ball, C. I. No. 6227, an African introduction which is unacclimated not only in Colorado but in the United States, should equal our best durum wheats in yield. Another surprise was the good showing made by the Black American oat. This variety far outyielded our standard, Kherson (C. I. No. 459). Nebraska No. 21 (C. I. No. 841), an oat of the Kherson type, also made an excellent showing.

Thrashing of nursery wheat will start within the next few days. Owing to the misfortune which occurred to our nursery this will not be such a long job. The thrashing of nursery oats and barley, however, will require a considerable amount of time.

Altho no rains, heavy enuf to be of any value to growing crops, have fallen at Akron Field Station so far this month, several very heavy showers have been received at and near Akron, and the dry weather has been broken to some extent. Corn is developing well, despite weather conditions, and will soon be in the hard dough stage. Sudan grass, sorghum and millet crops are headed and will soon be ripening. Pinto beans are growing fairly well. Possibly half of the wheat crop is thrashed and a few farmers have started to prepare their fields for fall seeding.

Highest Yielding Spring Wheat Varieties

Durum Kubanka -	Monad, C. I. No. 3320	8.68	Bu. per A.
" Pelissier -	Pelissier, C. I. No. 1584	8.30	" " "
" Red Durum -	D-5, C. I. No. 3322	6.49	" " "
" Misc. Durums -	Gold Ball, C. I. No. 6227	8.86	" " "
Common Wheats			
" Fife -	Marquis, C. I. No. 3641	8.54	" " "
" Preston -	Pioneer, C. I. No. 4324	13.85	" " "
" Blue Stem -	Haynes, C. I. No. 2874	2.75	" " "
" Misc. Common -	Prelude, C. I. No. 4323	17.62	" " "

Highest yielding plat of spring wheat -- Prelude C. I. No. 4323, 18.75 bu. on corn-stubble.

Highest Yielding Spring Oat Varieties.

Early Varieties	Nebr. No. 21, C. I. No. 841	14.04 Bu. per A.
Medium Early Varieties	Black American, ----------	17.55 " " "
Mid-Season Varieties	Lincoln, C. I. No. 738	5.85 " " "
Late Varieties	White Tartarrian, C. I. No. 300	2.04 " " "

Highest yielding plat of oats, Black American C. I. No. ----, 28.12 bu. on fallow.

Highest Yielding Spring Barley Varieties.

2-row hulled barley	Black Hull, C. I. No. 878	12.89 Bu. per A.
2-row hull-less barley	Baku, C. I. No. 709	7.31 " " "
6-row hulled barley	Coast, C. I. No. 690	10.16 " " "
6-row hull-less barley	Nepal C. I. No. 595	5.92 " " "

Highest yielding plat of barley, Black-hull, C. I. No. 878, 20.3 bu. on fallow.

WYOMING

Cheyenne Experiment Farm, Archer. (A. L. Nelson) There have been 1.14 inches of precipitation thus far during August. The temperature has been mild. The maximum temperature was 90° and the minimum 34°.

The winter wheat has been harvested, and also a considerable portion of the spring grains. Due to the abundance of stem rust, which broke out in the latter part of July and the fore part of August, the yields and quality of the cereals will be greatly reduced. The rust, in connection with the dry weather during the past week, caused the grain to ripen much ahead of time. Pioneer and Erivan resisted the rust better than any of the common spring wheats. Of the Durum varieties seeded in plats, Acme, Golden Ball, and D-5 were only slightly infected with rust. In the nursery rust experiment, White Spring emmer, C. I. No. 3686, was quite resistant, and the Khapli emmer, C. I. No. 4013, had a trace of rust. Prelude evidently escaped rust. Among the durum varieties, D-5 showed the most resistance, with Acme and Monad ranking second.

The major part of the harvest will be completed next week after which thrashing will commence. The station has received a new Ellis-Keystone Champion thrasher, furnished by the Office. This will greatly facilitate thrashing.

The first date-of-seeding of winter wheat was made on August 15.

In this locality about 50 per cent of the acreage seeded to grain will be harvested, with a yield of about 6 to 7 bushels per acre. In many cases new settlers are anxious to dispose of their newly acquired holdings, while older settlers are raising the price of their land.

Sheridan Field Station, Sheridan. (Leroy D. Willey) (Aug. 3-9) The past week has been another dry one, and somewhat hot for this late in the season. The

following data have been obtained:- Maximum temperature 93°, mean maximum temperature 90°; minimum 50°, mean minimum temperature 58°; precipitation .02 inches; total evaporation 2.155⅞ inches; and average wind velocity 4.7 miles per hour$.

Thrashing of small grains was finished during the week. Winter wheat yields were very good, considering the kind of season we have had, but the yields of other grains were practically nothing. The average yield of the three plats of winter wheat varieties are given below, with also the highest and lowest yields from the triplicated plats:

Variety	C. I. No.	Ave. Yield	High Yield	Low Yield
Turkey	1571	11.4	13.7	10.2
Ghirka	1438	9.6	12.2	5.8
Beloglina	1543	8.9	11.0	4.8
Crimean	1559	13.9	17.3	8.7
Kharkov	1442	17.2	23.3	11.3
Buffum 17	3330	10.3	16.0	5.8
Kanred	5145	11.9	18.3	5.3

It might be said that among the plats carrying rates and dates of seeding of winter wheat, there were a number that went as high as 20.0 bushels per acre, but that the majority of them were below 10 bushels.

Spring wheat, oats, and barley were so very poor that yields can hardly be assigned to them.

SOUTH DAKOTA

Bellefourche Experiment Farm, Newell. (A. D. Ellison) Generally fair weather with frequent rains occurred during the first half of August. The period of dryness prior to this time was of such long duration that crops growing on dry land produced poor stands and, in some instances, were total failures. Recent rains, however, have been of material benefit to millets and koaliang growing on dry land. Maximum temperature for the first half of August was 98° on the 11th; minimum, 50° on the 14th; precipitation 0.96 of an inch.

With the exception of millets and late-sown flax, all cereal varieties have been harvested. Thrashing of cereal varieties growing in field plats on both dry and irrigated land has been finished. Thrashing of nursery material is under way.

The following average yields were obtained from cereals grown under irrigation, plats replicated 3 times.

Spring Wheat

C. I. No.	1440	Kubanka (durum)	29.7 Bu.
" "	3025	Power Fife	27.5 "
" "	2874	Haynes Bluestem	27.5 "
	4782	Pringle Champlain	27.3 "

Spring Wheat (continued)

C. I. No.	5284	Acme (durum)	26.1 Bu.
" "	3276	Marquis	19.4 "
" "	3663	Dicklow	19.4 "
" "			

Spring Oats

C. I. No.	551	White Russian	63.0 Bu.
" "	778	"Pete Edwards"	61.0 "
" "	782	Silvermine	56.8 "
" "	134	Swedish Select	52.1 "
" "	884	Canadian	50.5 "
" "	165	Sixty-Day	42.7 "

Spring Barley

C. I. No.	530	Chevalier	32.0 Bu.
" "	936	Trebi	28.8 "
" "	531	Hannchen	27.8 "
" "	690	Coast	25.4 "
" "	595	Nepal	18.4 "
" "	905	Manchuria	17.7 "
" "	620	Himalaya	17.5 "
" "	1524	White Spring Emmer	59.4 "

Flax

C. I. No.	12	Primost	12.2 Bu.
" "	8	N. D. R. No. 52	12.2 "
" "	19	Russian	11.9 "
" "	3	Damont	10.7 "
" "	13	N. D. R. No. 144	8.6 "

The following average yields were obtained from cereals grown on dry land, plats replicated 3 times:

Durum Wheat

C. I. No.	4064	Arnautka	9.9 Bu.
" "	5284	Acme	9.7 "
" "	3320	Monad	9.7 "
" "	1493	Arnautka	9.4 "
" "	1516 -715	Kubanka Selection	9.0 "
" "	5296	Mindum	9.0 "
" "	1516	Kubanka	8.9 "
" "	1440	Kubanka	8.7 "
" "	3322	D-5	8.6 "
" "	1440-735	Kubanka Selection	8.6 "

Spring Oats

C. I. No.	293	Burt	5.7 Bu.
" "	165	Sixty-Day	5.5 "
" "	165-566	Sixty-Day Selection	5.2 "
" "	787	Richland	5.0 "
" "	459	Kherson	4.4 "

Spring Barley

C. I. No.	690	Coast	9.8 Bu.
" "	658	Smyrna	9.2 "
" "	638	Manchuria	9.0 "
" "	182	Odessa	8.0 "
" "	575	Gatami	7.1 "
" "	531	Hannchen	6.1 "
" "	620	Himalaya	5.4 "
" "	595	Nepal	3.0 "
" "	1524	White Spring Emmer	8.9 "

Cottonwood Substation. (Manley Champlin) No report.

Highmore Substation. (E. S. McFadden) Threshing is in full blast on the Highmore station. Yields are much better than had been anticipated. Cole oat, S. D. 316, a selection from Sixty-Day, is yielding from 40 to 70 bushels per acre; Odessa barley, C. I. 182, from 25 to 40 bushels; Acme wheat, C. I. 5284, from 15 to 20 bushels and weighing from 61 to 64 pounds per bushel; Advance rye, C. I. 189, from 20 to 35 bushels; Kharkov winter wheat, C. I. 1442, from 15 to 30 bushels; Khapli emmer, C. I. 4013, from 30 to 50 bushels.

The yields given above are for our leading varieties grown on the rotation plats, and are considerably higher than for the common varieties grown on farms in this locality. Only a few plats in the varietal experiments have been thrashed. Arnautka, C. I. 4064, and Marquis, C. I. 3641, are the only spring wheat varieties, with the exception of Acme, that have been thrashed. Both of these varieties were badly injured by stem rust and consequently gave low yields and low test weights.

From the data available at present, it appears that the yields of spring wheat varieties this year will be closely correlated with rust resistance. The rust resistant durums, Monad, D-5, and Acme, are all of excellent quality but the common wheats, as well as most of the durums, are badly shrunken. Mindum, C. I. 5296, supposed to be rust resistant under Minnesota conditions, is badly rusted on this station and is of rather poor quality.

Eureka Substation. (Manley Champlin) No report.

Vivian. (Manley Champlin) No report.

Brookings. (Manley Champlin) No report.

NORTH DAKOTA

State Experiment Station, Agricultural College. (Theodore Stoa) Harvesting of small grains is about completed in this region and thrashing has commenced in a small way. To people not fully realizing the damage due to black rust, which seriously affected the grain in its later stages of development, the yields are proving very disappointing. Wheat will average from 8 to 12 bushels of an inferior quality of grain. In Stutsman County about 25 per cent of the wheat acreage has not been considered worth cutting because of rust damage.

Flax is very promising in the Valley. Grasshoppers, however, are doing much damage by cutting off the bolls. Corn prospects are very good. Rain is overly plentiful and delaying the fall work.

Labor is plentiful. Wages through harvest averaged about $4.00 per day with an advance to $5.00 as threshing opens up.

Dickinson Substation. (Ralph W. Smith) A few light showers have occurred this month and, together with some cool weather, have been of some help to corn, potatoes and other crops not yet matured. All cereal crops at the Substation have been harvested except flax and corn. The flax varieties are ripening and are in fairly good condition.

There is but very little flax in this community, due partly to the dry condition of the ground at seeding time which prevented germination. The stand of corn was reduced in many cases by poor germination, but cut worms did a great deal of damage, almost destroying the stand in many fields. There is considerable interest manifested in the growing of corn in this section. Fields of corn, where the stand is fairly good, will help many a farmer to keep his stock through the winter and will probably produce more feed per acre than any other forage crop this year. In some localities about the only grain worth harvesting was grown on corn land.

At the Substation, ten varieties of corn are being tested in tenth-acre plats and a few ear-row selections are grown. Northwestern Dent is most widely grown, but suckers badly and the ears grow low in this locality, so that in dry seasons it is difficult to harvest with the corn binder.

On August 13, thrashing of the rotation plats was begun. The best yield was nine bushels per acre. Thrashing yesterday and today was prevented by high winds.

MONTANA

Judith Basin Substation, Moccasin. (P. V. Cardon) No report.

WESTERN BASIN AND COAST AREAS (South to North and West)

UTAH

Nephi Substation, Nephi. (Aaron F. Bracken) No report.

IDAHO

Aberdeen Substation, Aberdeen. (L. C. Aicher) Mr. C. W. Warburton arrived on August 4 for conference with Mr. Stanton, and study of the oat nursery.

Mr. Pope completed his study of the barley nursery and left on August 7 for points east.

Mr. Fred N. Briggs arrived on August 5 to study and record data on smut infection, for Dr. Reed. The cereal disease nursery is in excellent condition and Mr. Briggs seems to be enjoying himself immensely.

OREGON

Harney Branch Station, Burns. (Obil Shattuck) No report.

Sherman County Branch Station, Moro. (D. E. Stephens) No report.

WASHINGTON

Adams Branch Experiment Station, Lind. (M. A. McCall) No report.

CALIFORNIA

Plant Introduction Field Station, Chico. (V. H. Florell) No report.

Rice Field Station, Biggs. (Jenkin W. Jones) ~~No report~~. We are having good rice weather at present. Many of the commercial fields sown to early varieties are practically fully headed, and with favorable weather will be ready to harvest about October 1. Many of the old rice fields are so badly overrun by water-grasses that it is hardly possible to see any rice on them at present. These fields will undoubtedly yield low, and some may yet be abandoned.

P6917

RECD LIBRARY SEP 1 1919 BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

- - - - - - - - - - - - - - - - - - - -

Vol. 11. August 31, 1919, No. 14.
Personnel Issue, (June-August)

DOINGS OF CEREAL INVESTIGATIONS PERSONNEL

The many items of interest concerning the Office personnel include appointments, transfers, resignations, and general movements. They are grouped under three main heads, namely, Administrative, Agronomic, and Pathologic. The Pathologic is further subdivided by major projects, as (1) Imperfect and Sac Fungi; (2) Rusts, including barberry eradication; (3) Downy Mildews; and (4) Smuts. No doubt some items will escape the reporters in spite of care.

ADMINISTRATIVE PROJECT PERSONNEL

Charles P. Ashton, of the District, was appointed as typewriter on July 7. He has been placed in charge of supplies and other property, including storage, shipments, requisitions, and inventory.

Edwin S. Baker, of the District, was appointed messenger on June 6. He has been helping Miss Stevens with the files during Miss Peacock's vacation.

C. R. Ball, Cerealist in Charge, held a conference of State Leaders and Assistant State Leaders of the barberry eradication campaign at State College, Ames, Iowa, July 10-12. Nearly all were present and three days and nights were given to strenuous conference on eradication problems.

Miss Romye I. Burnes, of Georgia, was appointed clerk on August 4. She is assigned to the fiscal section and is helping handle reimbursement vouchers.

Robert S. Caruthers, who helped us as vacation messenger last summer, came back to the job again on June 26.

Mrs. Flora (Justin) Chesbrough, who has been the efficient stenographer for the Flax and Grain-sorghum projects, resigned on July 31. Her husband had obtained his discharge from the Motor-Transport Corps, and went at once to Toledo, Ohio, where he resumed his position with the Willys-Overland Company.

Mrs. Nellie B. Dimmette, of North Carolina, was appointed stenographer on July 1, and assigned to the Pathologic Division, with Dr. Humphrey.

Foster Edwards, of South Dakota, was appointed messenger on June 27 and resigned on August 8.

Miss Ethel I. Elsbury, of Illinois, was added to the staff as clerk-typewriter on June 9 and has been serving both administrative and agronomic divisions as stenographer and typist.

Miss Jennie Farson, of Maryland, was appointed stenographer on August 11 and has been serving in the administrative section most of the time.

Mrs. Judith M. Fishburn, of Maryland, was appointed typewriter on June 11 and has been serving as stenographer in the administrative section of the Office.

Miss Alice E. Flynn, in charge appointments and authorizations, returned on August 25 from a vacation at her home in Wisconsin..

Miss Kathryn L. Foley, who has served as typist in the fiscal section since last April, resigned on July 23, because of ill health, and will take a good rest.

Norman A. Gray, messenger in the administrative section, returned on August 26 from his vacation spent at Villa, Md.

Miss Myrtis V. Hall, of Minnesota, was appointed stenographer on August 15 and is assigned to the barberry eradication project.

Miss Rose Lefebvre, stenographer in the cereal disease project, returned on August 18 from a vacation spent in Elk River, Minnesota.

Edward H. Johnson, formerly assigned as special temporary disbursing clerk at Waco, Texas, in connection with the purchase of seed of corn, cotton, and sorghums by the Federal Feed Stocks Committee, was transferred to this office on July 2, and assigned to the fiscal section for service at the Office of Records.

William H. McCoy, temporary clerk since last February, resigned July 15 to accept a position elsewhere.

John W. Meshaw, of New Hersey, was appointed skilled laborer on June 5 and assigned to the cereal disease project.

Miss Ada D. Miller, of Mississippi, a clerk in the Disbursing Office, was transferred to this Office on July 1 and is serving in the fiscal section. She recently left for a vacation at her home, accompanied by a sister just home from war work in France.

Miss Alpha E. Myers, stenographer for the barley project, returned on August 25 from a vacation at her home in Illinois.

Miss Eva M. Peacock, mail clerk of the Office, returned on August 24 from a vacation at her home in Virginia.

Mrs. Eulalia G. (Mahoney) Perry, messenger in the cereal disease project, resigned on June 15, to take up home duties.

Miss Dorothy M. Powers, stenographer in the cereal disease project, resigned on June 28 while away on vacation.

Miss M. Helena Pray, formerly with the Fuel Administration and the Red Cross, was appointed stenographer on June 25 and is serving in the administrative section. She returns on September 2 from vacation spent in New York and Vermont.

Miss Virginia Putman, bookkeeper in the fiscal section, spent the latter part of May and early June at her home in Alabama, enjoying a brother just back from France.

Cooper B. Rhodes, of the District, was appointed messenger on August 12 and assigned to the administrative project.

Miss Clara M. Rollins, who was transferred from Corn Investigations in early summer as stenographer for Western Wheat Investigations, resigned on June 23 on account of the ill health of her mother and returned to her home in South Dakota.

William F. Rooney, of Massachusetts, was appointed stenographer on August 13 and is serving with the administrative section.

Miss Rosina Smith, formerly stenographer for Eastern Wheat Investigations, resigned May 30 at the end of vacation spent at home in Kansas City.

Miss Laura Trauger, of New Jersey, was appointed stenographer on July 1 and has been serving the administrative section.

Miss Bonny M. Webber, of Missouri, was appointed typewriter on August 8 and is helping in the administrative section.

AGRONOMIC PROJECTS PERSONNEL

On July 16, the Office of Corn Investigations was officially united with the Office of Cereal Investigations. This change added the following corn specialists to our scientific force: C. P. Hartley, E. B. Brown, C. H. Kyle, F. D. Richey, J. G. Willier, J. M. Hammerly, G. J. Burt, H. F. Stoneberg, H. S. Garrison, L. S. Mayer, and M. T. Jenkins.

Henry P. Ames, who has been assisting in the cereal experiments at Arlington Farm, during the past several months, terminated his period of service at the end of July.

Ernest B. Brown, Assistant Physiologist in Corn Investigations, left Washington on August 5 to visit San Antonio, Waco, Marshall, and Eagle Lake, Texas; Crowley, Louisiana; Clarksdale, Mississippi; and Burdette, Arkansas; for the purpose of securing data upon corn experiments and harvesting experimental corn plats. He expects his trip and work to take approximately 8 weeks.

Charles E. Chambliss, Agronomist in Charge of Rice Investigations, sailed for Porto Rico and Santo Domingo on June 21 for an extended trip in behalf of the rice investigations of the Department. He is conducting rice experiments in cooperation with the Porto Rico Agricultural Experiment Station, Mayaguez, to determine the possibilities and prospects of a rice-growing industry in Porto Rico. Through the courtesy of Mr. Holger Johansen, Director, Department of Agriculture, Santo Domingo, he proceeded to Santo Domingo to carry on similar investigations. Mr. Chambliss is due to arrive in Washington about September 3.

Charles H. Clark, Assistant Agronomist in Charge of Flax Investigations in this Office for the past several years, has resigned effective September 15 to accept a position with the Albert Dickinson Company, of Chicago. He returned on August 15 from his field trip to Minnesota and North Dakota. Since his return, he has completed the manuscript of a bulletin on some phases of the experiments conducted at the Northern Great Plains Field Station, at Mandan, North Dakota. He left Washington for Chicago on August 26.

J. Allen Clark, Assistant Agronomist in Charge of Western Wheat Investigations, left Washington on July 1 for a tour of inspection of field stations in the western half of the United States, in the interest of wheat investigations. He visited field stations in Kansas, California, Oregon, Idaho, Utah, Wyoming, Colorado, Nebraska, Minnesota, North Dakota, Montana, and South Dakota, completing his trip at Ithaca, New York, from which point he took a week's leave of absence to spend with his family on a vacation trip in New England. He returned to Washington August 19.

F. A. Coffman, in charge of cereal experiments at the Akron Field Station, Akron, Colorado, writes that he has relinquished the rights to his homestead in Colorado to his brother, who has been released recently from military service. This enables Mr. Coffman to remain permanently with the Office.

V. H. Florell, in charge of cereal experiments at the Plant Introduction Garden, Chico, California, has been spending several weeks in the classification and hybrid wheat nurseries at Corvallis and Moro, Oregon, assisting in the study and harvest of this material. He has also been authorized to visit the Experiment Stations at Pullman and Lind, Washington. It is expected that he will return to Chico during the first week in September.

H. S. Garrison, Scientific Assistant in Corn Investigations, returned to Washington on July 31 from a three-day trip to points in New York and New England. He visited Farmingdale and Rhinebeck, New York, and Williamstown, Massachusetts, for the purpose of making observations on the effect of cultivation vs. no cultivation on early and normal planted corn and to obtain comparisons of same between northern and southern conditions. The experimental work at the points visited by Mr. Garrison is under the personal supervision of L. S. Mayer, who conducted Mr. Garrison over the experiments and outlined the work.

Mr. Garrison and L. S. Mayer are now on a trip to Virginia and North Carolina for the purpose of harvesting early varieties of experimental corn and obtaining information on the maturity and adaptability of later varieties that were distributed for test purposes.

Mr. J. M. Hammerly, Assistant in Corn Investigations, returned from a six-day trip to Alabama, on August 11. He visited Montgomery, Prattville, Dothan, and Mobile where he was engaged in cutting and weighing ensilage corn experiments and obtaining notes on the tasseling, silking, adaptation and growth of corn varieties at those points.

H. V. Harlan, Agronomist in Charge of Barley Investigations, sailed from New York on May 2, and arrived at Plymouth, England, May 8, under detail to the U. S. Grain Corporation, for the purpose of making an extended tour through Central Europe to survey the food crops for the season of 1919. A seven-week trip was taken by automobile through southern France, northern Italy, across Jugo-Slavia, on by way of Crotia and Slavonia, through the great wheat district of southern Hungary, through Trans Sylvania to Bucharest in Rumania, north through Rumania, Bukowina, and Galicia to Warsaw in Poland; thence west through Germany to Holland; through Holland, Belgium and northern France to Paris, - the journey ending with a month's stay in Paris.

Dr. Harlan reports that throughout the trip it was noted that in eastern Europe the crop prospects are much better than official reports and rumors have indicated. In the wheat-producing region of southern Hungary, fully 95 per cent of the acreage is planted and the crop is in prewar condition. In that part of Rumania occupied by the armies of the Central Powers, a great deal of the land was not cultivated, and that which was in crop was in poor condition. This was due to the fact that the Teutonic armies removed the work stock and agricultural implements from the country. Rumania probably will be self-supporting and, if the maize crop continues to improve, may have an export surplus. There will certainly be an export from southern Hungary. Bulgaria is in prewar condition, and will probably export more than her average amount of cereals.

East Galicia has been fought over for five years. The peasant revolt of the Ukraines in Galicia was both an agrarian movement and a racial one, since the owners of the large estates were Poles. As a consequence, none of the large estates are cultivated in this section. Even here, however, fully 90 per cent of the peasant holdings are in crop.

On the eastern border of Poland and the western border of Russia, the population was largely evacuated during the war. The peasants are just now returning to this section. Food conditions, due to the lack of cultivation, are very bad. In a few places it was foundOthat peasants were living on a bread made from grass, nettle and heather.

Food shortages in Eastern Europe at the present time, however, are local. Wheat bread is common in all the markets, except Germany, where white bread is not to be had. Throughout Germany the entire acreage is under cultivation. The yield will probably not be normal, due to lack of fertilizers. Belgium is very highly cultivated, with good prospects for crops. France and England have both been seriously affected by drouth and their prospects are not encouraging.

Dr. Harlan sailed from Boulogne, France, August 9, arriving in Washington on August 23.

Merle T. Jenkins, Scientific Assistant, recently added to the force of corn specialists, having been appointed in May, 1919, returned to Washington on August 5 after completing the detasseling at Piketon, Ohio. Mr. Jenkins returned to Washington by way of Blacksburg, Virginia, for the purpose of securing data regarding corn improvement under way at the Virginia Experiment Station.

Mr. Jenkins left Washington again on August 16 for an 85-day trip. Mr. H. F. Stoneberg, who left Washington August 27, expects to join Mr. Jenkins at Brookings, South Dakota, and together they will visit various points in the states of South Dakota, North Dakota, Minnesota, Wisconsin, Illinois, and Ohio for the purpose of selecting and drying seed corn and harvesting experimental plats of corn.

Curtis H. Kyle, Assistant Physiologist in Corn Investigations, left Washington on July 7 for a short trip to South Carolina, to attend to his hand-pollinating experiments in the vicinity of Darlington. He returned to Washington on July 18.

Mr. Kyle left Washington again on August 16 to visit Brooksville, Miami, West Palm Beach, Moor Haven, and Okeechobee, Florida, for the purpose of selecting, drying, packing and shipping seed corn, harvesting field plats and taking field notes and arranging for plantings in 1920. Mr. Kyle reports that the quantity and quality of the corn at the Plant Introduction Field Station at Brooksville is poor this season.

C. E. Leighty, Agronomist in Charge of Eastern Wheat Investigations, has been assisting, during the summer, in an investigation of the sources of varieties of wheat grown on the Illinois and Indiana farms where take-all and flag smut have been found to exist. More recently, he has obtained data on the commercial movement of the wheat from Illinois fields after it receives the formaldehyde treatment by our men at the separators. He returned to Washington on August 29.

Alton L. Markley, Chemist from the Washington State College, assisted Mr. Pope in obtaining special data on barleys in the breeding nursery at Aberdeen, Idaho, from June 26 to August 13.

John H. Martin, Scientific Assistant in Western Wheat Investigations, left Washington on May 15 in the interest of wheat investigations and visited co-operative field stations in Kansas, Texas, Arizona, California, Oregon, Washington, Montana, Wyoming, South Dakota, and North Dakota. At present he is at Manhattan, Kansas, where he is preparing the seed samples of several varieties of wheat for sowing at about ten experiment stations in the Northern Great Plains area, to determine their winter hardiness.

Ludwig S. Mayer, Scientific Assistant in Corn Investigations, who has charge of the corn experiments in New York and New England, is particularly interested in observing the results of cultivation and no cultivation of corn in warm and cool climates. He is now on a trip with Mr. Garrison in Virginia and North Carolina.

John H. Parker, Agent of this Office and Plant Breeder of the Kansas Experiment Station, Manhattan, made a field trip during July and August to the Experiment Stations of Iowa, Minnesota, and North Dakota in connection with proposed cooperative experiments in wheat breeding. On August 25, he left Manhattan for a trip with Mr. Rothgeb, of this Office, covering the Field Stations at Woodward, Oklahoma; Amarillo, Texas; Tucumcari, New Mexico; Garden City, Kansas; and Hays, Kansas, in the interests of experiments in breeding grain sorghums.

M. N. Pope, Assistant in Barley Investigations, left Washington on June 11 to attend a proposed conference of cereal iagronomists at Davis, California, but at a very late date, this conference was postponed for a year. Mr. Pope inspected barley experiments at Davis and Chico, California, and at Pullman, Washington. He then proceeded to the Aberdeen Substation, Aberdeen, Idaho, where he spent six weeks in physiological, genetic, and taxonomic studies of barley, assisted by Alton L. Markley. In returning, he visited stations at Moccasin, Montana; Fargo, North Dakota; and St. Paul, Minnesota. He arrived in Washington August 17.

Fred D. Richey, Scientific Assistant in Corn Investigations, returned to Washington from an extended trip thru Arkansas, Missouri, Louisiana, Mississippi, Kansas, Iowa, North and South Dakota, Nebraska, Minnesota and Illinois. His duties comprised the detasseling and harvesting of experimental corn plats and securing information as to the behavior of varieties of corn under different environments and methods of corn culture.

B. E. Rothgeb, Scientific Assistant in charge of Grain-sorghum and Broomcorn Investigations, made a field trip to Texas and Oklahoma in June to study especially the production of broomcorn under irrigation in the lower Rio Grande Valley. In early August he left Washington for States in the Southern Great Plains area to continue field studies of grain sorghums and broomcorn, and the supervision of field experiments.

T. R. Stanton, Scientific Assistant in Oat Investigations, left July 21 for a long western trip. His particular work has been in the oat-breeding nurseries at Ames, Iowa, and the Aberdeen Substation, Aberdeen, Idaho. At the latter place, he met Mr. Warburton for conference on the oat project. He is now taking leave at Cumberland, Maryland, and will return to Washington in the early part of September.

D. E. Stephens, Superintendent of the Sherman County Branch Station, Moro, Oregon, has been visiting the experiment stations and cooperating substations in Oregon, Washington, Idaho, and Utah, during July and August.

Hugo F. Stoneburg, Scientific Assistant in Corn Investigations, returned to Washington on August 14 after spending four months in the middle West. During his stay in the West his attention and time was devoted to the planting, thinning detasseling and caring for experimental corn plats and keeping records regarding the progress of the experiments.

Arthur F. Swanson, appointed on June 1 to take charge of cereal experiments at the Fort Hays Branch Station, Hays, Kansas, was at the Kansas Experiment Station, Manhattan, during the week ending August 23 for conference on the experiments conducted at Hays. He is a graduate of Kansas State College, 1919, and was released from military service on November 20, 1918.

C. W. Warburton, Agronomist in Charge of Oat Investigations, has continued throughout the summer to make his headquarters at the Federal Building, Great Falls, Montana, where he is charged with the supervision of the crops grown by farmers who were financed by the President's Seed Loan Fund. At intervals he has been able to visit and inspect several of the western field stations of this Office. He hopes to be able to return to Washington about September 20.

C. M. Woodworth, Assistant Pathologist, whose headquarters are at Madison, Wisconsin, is spending several weeks at Fargo and Mandan, North Dakota,,, in his work of flax breeding for disease resistance.

PATHOLOGIC PROJECTS PERSONNEL

Dr. H. B. Humphrey, Pathologist in Charge, left Washington on July 27 for an inspection of our field, greenhouse, and laboratory investigation of cereal diseases throughout the country. He has been sending in manuscripts gathered up en route, containing the results of cooperative experiments. He will return to Washington early in September.

IMPERFECT AND SAC FUNGI.

Dr. A. G. Johnson, Pathologist in charge of investigations of Imperfect and Sac Fungi, has been Acting Pathologist in charge of all Cereal Disease Investigations for the past month during the absence of Dr. Humphrey on an extensive field trip. Dr. Johnson left Washington August 31 to attend a conference and inspect the experiments in corn rots at Bloomington, and then will return to headquarters at Madison, Wisconsin. While in Washington he completed plans for the field study of nematode infection of wheat in Maryland, Virginia, West Virginia and Georgia, and for extensive experiments at Arlington Farm. He also helped to plan the cooperative experiments in milling and baking wheat given formaldehyde treatment for take-all.

Corn Rots and Wheat Scabs

Ira L. Baldwin, was appointed Field Assistant in this Office, effective June 10, to assist Dr. Ralph H. Carr with the corn disease investigations being conducted in cooperation with Purdue University Experiment Station. Mr. Baldwin received the degree of Bachelor of Scientific Agriculture from Purdue University in June this year. He served with the 72 Regiment of Field Artillery as Second Lieutenant, during the war.

Harry A. Bossert, was appointed as laborer effective July 1, to assist Dr. J. R. Holbert with the field plats in corn rot investigations at Bloomington, Illinois. Mr. Bossert resigned effective July 28.

Dwight F. Bracken was appointed Field Assistant effective July 1. Since that time Mr. Bracken has been assisting Dr. J. R. Holbert in corn rot and wheat scab investigations, tabulating data on soil treatment and previous cropping of wheat fields. He also followed up thrashing machines to secure accurate yield data to supplement the wheat scab counts made just prior to harvesting. He has studied one and one half years at the University of Illinois.

Miss Nellie J. Briggs was appointed Field Assistant on June 24, and has been assisting Dr. J. R. Holbert with the corn rot investigations at Bloomington, Illinois. She has been making seed germination tests in the field and greenhouse. Miss Briggs had been attending Illinois State Normal University prior to her appointment in this Office.

Leroy E. Compton was appointed Assistant Pathologist, effective May 5, to investigate the outbreaks of wheat scab and their relation to corn root rots. He will assist with the work in Indiana and surrounding States. Mr. Compton will receive the degree of Bachelor of Scientific Agriculture, in June, from Purdue University.

Dr. James G. Dickson, of Madison, Wisconsin, who assists Dr. A. G. Johnson in the investigation of cereal diseases caused by the sac and imperfect fungi, particularly scab of wheat, arrived in Washington on August 25, to confer regarding special features of the work. He left for Bloomington and Madison with Dr. Johnson on August 30.

Charles E. Dodge, was appointed as laborer on July 1 to assist in the plats in the investigations of the Fusarium rots of corn at Bloomington, Illinois.

Jesse M. Dunn, who has been studying at Purdue University during the past year, was appointed Field Assistant effective July 1. Mr. Dunn has been assisting Dr. G. N. Hoffer at LaFayette, Indiana, with investigations of the root stalk and ear rots of corn. Mr. Dunn was honorably discharged from the S. A. T. C. in December last year.

Leslie M. Ernst, bookkeeper and typist, who has been keeping records and tabulating data from the experiments on corn diseases at Bloomington, Illinois, since March 24, resigned on July 19.

Robert W. Goss, has been appointed Assistant Pathologist, effective June 3. Mr. Goss will assist with the investigations of the Fusarium rots of corn and the relation between that disease and wheat scab. He will travel in Wisconsin and adjoining states, with headquarters at Madison, Wisconsin. Mr. Goss received the B. S. degree from the Michigan Agricultural College in 1914 and his Master's degree in 1915. He did research work in Plant Pathology at the University of Wisconsin for one year.

Miss Lucy C. Joyer, who was employed the past year as clerk in the Treasury Department, was transferred on June 2, to this Office. She is stationed at Madison, Wisconsin, where she is assisting with the clerical work incident to the cereal disease investigations being conducted there by Dr. A. G. Johnson.

Benjamin Koehler has been appointed Field Assistant, effective May 5, to investigate the outbreaks of wheat scab and their relation to corn root rots. He will work in Illinois, Indiana, Wisconsin, and Ohio and surrounding states, where the outbreaks of wheat scab have been causing much concern. Mr. Koehler was employed in the Bureau of Aircraft Production until the latter part of November, last year.

Herdis L. Lewis, Assistant in Plant Pathology, who has been assisting with the investigations of the Fusarium rots of corn since June 1, was transferred on September 1 to work in connection with seed disinfecting. Mr. Lewis was engaged on the smut control campaign last year.

Otto P. Tieman, who received the B. S. from Purdue University in 1916, has been appointed Assistant Pathologist, effective May 19, to assist with the cooperative investigations of the Fusarium rots of corn, at Bloomington, Illinois.

Flax Wilt and Canker

Charles S. Reddy, Assistant Pathologist in Charge of Flax Disease Investigations, has been making summer headquarters at Agricultural College, North Dakota, where extensive cooperative investigations are in progress.

Prof. C. M. Woodworth, in charge of breeding flax for disease resistance, has spent several weeks at the Field Station at Mandan, North Dakota, engaged in extensive genetic studies. He has been accompanied by Mrs. Anna Woodworth as Field Assistant.

Rotten-neck and Straight-head of Rice

Dr. W. H. Tisdale, Pathologist in Charge of investigations of rice diseases, came in for a few days of conference and planning recently. It is expected to add largely to the equipment for pathologic research at the Rice Experiment Station, Crowley, Louisiana, where Dr. Tisdale makes his headquarters. While enroute to Washington, he made field inspection in several Southern States to determine occurrence of infection by physoderma disease of corn. On leaving Washington, he proceeded to Bloomington, Illinois, and Madison, Wisconsin, to confer regarding special apparatus for his investigations.

Take-All Survey and Disinfection.

A large number of cooperating pathologists in the various States took part in the survey, during May and June, to determine the distribution of take-all in this country. The following men have been giving full time service to the more intensive survey of infested areas in Illinois and Indiana and to the treating of the thrashed wheat to prevent spread of infection.

Robert V. Allison was appointed Field Assistant, effective June 18, to assist with the investigations of the take-all and flag smut diseases of wheat in Indiana and adjacent states. On August first, Mr. Allison was transferred to the barberry eradication campaign in that section. Mr. Allison studied three years at Purdue University, previous to his appointment in this Office.

Sanford A. Campbell, who was appointed Field Assistant on June 7, was engaged in the take-all survey in Indiana and neighboring States until August first, when he was transferred to assist with the barberry eradication campaign in Indiana. Mr. Campbell received his Bachelor's degree from Purdue University last spring.

Charles Dreschler, Scientific Assistant, has been engaged on the take-all survey since July first. From April first to June 30, this year, Mr. Drechsler was in the Office of Cotton Truck and Forage Crop Investigations, investigating the alfalfa crown-wart disease.

Archie L. Gibson, was appointed Field Assistant in this Office, effective June 10. From the time of his appointment until the last of July, Mr. Gibson assisted with the investigations of the take-all and flag smut diseases of wheat in Illinois and other States. On August first, Mr. Gibson was transferred to the barberry eradication campaign. He served with the United States Navy during the recent war.

Dorr D. Green, who received his Bachelor's degree from Oregon Agricultural College in 1917, was appointed Field Assistant in Plant Pathology on June 10, this year. He assisted with the take-all and flag smut investigations until the last of July. Since August first he has been assisting with the barberry eradication campaign. Mr. Green received his discharge from the U. S. Medical School last spring.

Budd A. Holt was appointed Field Assistant, effective August 1, to assist with the investigations of the take-all and flag smut diseases of wheat in Illinois and neighboring states. Prior to his enlistment in the U. S. Army, Mr. Holt studied three years at the University of Minnesota. He served with the A. E. F. from July 1918 to the spring of 1919.

Henry W. Holt, who was appointed Field Assistant effective June 10, to assist with the take-all and flag smut investigations in Illinois, was transferred on August 20, to the Federal Horticultural Board, for work incident to the potato-wart investigations in North Dakota.

Edwin J. Kepler, who received his Bachelor's degree from Pennsylvania State College in 1916, was appointed Field Assistant in Plant Pathology on July 10. He assisted with the emergency measures being taken to treat all seed threshed from fields infested with the take-all and flag smut diseases until the first of August, when he was transferred to the barberry eradication campaign in Ohio on August 7.

Carl Kurtzweil left his rust investigations in Tennessee in August long enough to run up to Hopkinsville, Kentucky, and treat with formaldehyde a car of wheat shipped there from Illinois.

H. H. McKinney, Assistant Pathologist in charge of the field campaign to control take-all in Illinois and Indiana, has completed supervision of disinfection of grain at the separators. He spent a few days in Washington in late August conferring with Dr. Johnson about rotation experiments and other control measures.

John H. Shaw, was appointed Agent, effective July 11. He will care for field plots and gardens in connection with the Cereal Disease Control Investigations being conducted in cooperation with the State of Wisconsin. He will be stationed at Madison, Wisconsin.

Herbert Spencer was appointed Field Assistant in Plant Pathology on July 10 to assist with the take-all and flag smut survey and control, with which he continued up to August first. On August first, he was transferred to the barberry eradication campaign in Ohio. Mr. Spencer received his Bachelor's degree from the North Carolina Agricultural College in 1915 and his Master's degree in 1917. He served with the U. S. Army during the war.

Robert W. Webb was appointed Field Assistant in Plant Pathology on June 23. He has been assisting in the control of take-all and flag smut since his appointment. Mr. Webb received his Bachelor's degree from Clemson College, South Carolina, and his Master's degree from Washington University.

Milton C. Zellmer, who received his B. S. degree from the University of Wisconsin, was appointed Assistant Pathologist effective May 22. Since his appointment Mr. Zellmer has been engaged in disinfection of wheat infected with take-all and flag smut in Illinois. He served with the U. S. Navy as Ensign during the recent war.

Eelworm or Nematode Disease of Wheat.

H. A. Borthwick, Field Assistant, appointed April 19, 1918, who has been engaged in the smut control campaign and cereal disease survey during the past 2 seasons, was transferred to the field investigation of the nematode disease of wheat on August 14, 1919. He is now engaged in Maryland and will proceed to West Virginia later.

R. A. Carroll, Assistant Pathologist, appointed November 16, 1918, who has been engaged in the smut control campaign and cereal disease survey, was transferred to the field study of the wheat nematode on August 11, 1919, and is making a survey of conditions in Georgia.

J. H. Clark and J. C. Fischer, Field Assistants, who were engaged last year in the smut control campaign in the Southeastern States, were reappointed on June 9, 1919, to make a field survey for wheat nematodes on the eastern shore of Maryland. They completed this work on August 31, 1919.

Miss Grace O. Furrow was appointed Plant Pathologist effective July 11. At present Miss Furrow is engaged upon a laboratory study of nematode-infected cereals from the experimental plats at Arlington and in analyses of samples resulting from the field survey in the Southeastern States. Miss Furrow studied three years at Oberlin College, Oberlin, Ohio, and received her B. S. degree from Chicago University in 1918.

Budd A. Holt, Field Assistant, appointed April 19, 1918, who has been engaged in the smut control campaign and cereal disease survey, was transferred to the field survey for nematode of wheat on August 14, 1919, and is now engaged in Maryland and will proceed to West Virginia later.

R. W. Leukel, Scientific Assistant, in charge of the investigation of the eelworm or nematode disease of wheat, has been exceptionally busy recently organizing the infection and rotation experiments at Arlington Farm and starting the field study of nematode infection in Maryland, Virginia, West Virginia, and Georgia.

Miss Hallie Marvin was transferred from the Office of Cotton, Truck and Forage Crop Disease Investigations on July 1, where she had been assisting in the investigations of nematode diseases of cotton, truck and forage crops. Since her transfer, Miss Marvin has been engaged upon a laboratory study of the nematode disease of wheat. Miss Marvin was graduated from the University of Southern California in 1918.

POSTSCRIPT

Owing to the large number of personnel items, it becomes desirable to close this issue at this point. Personnel of the remaining pathologic projects (2) rust investigations including barberry eradication, (3) downy mildews, and (4) cereal smuts, will be covered in a succeeding issue.

6917

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

- -

Vol. 11. August 31, 1919 (Continued), No. 15.
Personnel Issue (June-August, Continued).

- -

BUREAU OF INDUSTRY

PATHOLOGIC PROJECT PERSONNEL (Continued)

As noted at the end of the last issue, so many items had accumulated during the summer as to make it desirable to run two issues on personnel. This issue completes the pathologic projects.

RUST INVESTIGATIONS

Personnel items will be found under the Black Rust, Barberry Eradication, Crown Rust, Leaf Rust, and Stripe Rust.

Black Rust

F. F. Blaine, has been traveling through the provinces of Manitoba, Saskatchewan, British Columbia and Alberta, Canada, since August 20, collecting information relating to the distribution, abundance and economic importance of the common barberry and its relation to recent local epidemics of black stem rust in our adjacent States.

Wallace Butler, Field Assistant, has been studying and collecting black rust in Oklahoma, Texas, Colorado, New Mexico and Louisiana, since his appointment May 12, this year.

Dr. Henry S. Conard, Botanist of Grinnel College, Grinnell, Iowa, was appointed Field Assistant, effective July 1, to assist in investigations of the epidemiology of black rust. From August 5 to September 20, last year, Dr. Conard was under appointment as Assistant Pathologist in this Office, assisting in the barberry campaign.

Ibra L. Conners, was appointed Field Assistant, effective May 21, to assist with the black rust survey in Minnesota and other Northern States. Mr. Conners is a graduate student at the University of Toronto, Toronto, Canada, having received his A. B. degree from McMaster University.

Dr. G. H. Coons, Botanist of the Michigan College and Station, was appointed Field Assistant on July 1, this year, for one month, having obtained one month's furlough from his college duties to enable him to assist in the black rust investigations in Colorado. He collected rusts and made observations on

the relation of wild and cultivated barberry to the presence of rust and determined the relation of grasses to the epidemiology of rust. Effective August 1, Dr. Coon's appointment was changed to Collaborator.

Wilmer E. Davis, who has been an Instructor at the Kansas Agricultural College for the past five years, was appointed Field Assistant, effective July 1. Since his appointment he has been assisting with the black rust investigation, collecting grasses, grass seed, seed specimens of Boraginaceae and Ranunculaceae and any rusts occurring on plants coming under his observation. Mr. Davis received the A. B. degree from the University of Illinois in 1903.

William L. Doran, Scientific Assistant, was transferred to this Office on July 1, from the Office of Cotton, Truck and Forage Crop Disease Investigations, where he had been under appointment since November 21, 1917. Since his transfer, Mr. Doran has been assisting with the black rust investigation in the New England States.

James F. Groves was appointed Plant Pathologist, effective June 6, to assist with the black rust investigations in Wyoming and adjoining states. Mr. Groves received his Ph. D. degree at the University of Chicago, and for several years has been Professor of Botany at the University of Wyoming.

Ansel F. Hemenway resigned from his position as Assistant Pathologist, effective August 18. Mr. Hemenway, who has been assisting with the black rust investigations in Ohio and West Virginia, expects to resume his position as Instructor in Transylvania College.

Richard M. Holman, Instructor in Botany at Wabash College, Crawfordsville, Indiana, was appointed Field Assistant in this Office, effective June 13, and since his appointment has been assisting with the black rust investigations in the New England States. From August 28 to November 27, 1918, Mr. Holman was under appointment as Field Assistant in this Office, to assist with the barberry eradication campaign. He received his A.B. degree from Stanford University in 1907 and his Doctor's degree from the University of California in 1915.

Claes W. Johnson, Assistant Pathologist, who from May, 1918, has been under appointment in this Office, resigned effective June 30, to resume work on his orange ranch at Claremont, California. Mr. Johnson was engaged in smut control and black rust investigations in California, prior to his resignation.

Lewis Y. Leonard has been appointed Assistant Pathologist, effective May 12, to assist with the rust survey in Washington and surrounding states. Mr. Leonard, who is a graduate of the Washington State University, has been employed for some time at the Experiment Station, Washington State College.

John N. Martin, of the Department of Botany, Iowa State College, appointed Field Assistant June first, resigned on August 27. Since his appointment, Mr. Martin has been assisting with the black rust investigations.

Creighton F. Murphy, a graduate of the Pennsylvania State College of Agriculture, was appointed Assistant Pathologist, effective May 16, to assist with black rust investigations in Pennsylvania and surrounding states. Mr. Murphy was then recently discharged from the United States Army where he had served since February, 1918.

John H. Parker, in charge of Crop Improvement in the Division of Farm Crops of the Department of Agronomy, Kansas Experiment Station, has been appointed Agent, effective May 1, to take charge of the cooperative investigations of breeding and selection of wheats and other cereals for rust resistance in Kansas.

James P. Poole was appointed Field Assistant, effective July 11. Mr. Poole, since his appointment, has been assisting with the investigations of black and strip rust and other cereal diseases, in Wyoming and adjacent States. He received his B.S. degree from the University of Maine and his Master's degree from Harvard University.

Henry W. Thurston, Jr., Associate Plant Physiologist of the University of Nebraska, was appointed Plant Pathologist, on June 9, to assist with the black rust investigations in Nebraska and adjacent states. Mr. Thurston received his B.S. degree in 1915 from the University of Illinois and did graduate work in botany at Columbia University.

Barberry Eradication.

Dr. Forrest E. Kempton, who was appointed Assistant Pathologist on March 1, to become Assistant State Leader of the barberry eradication campaign in Illinois, was made Pathologist in Charge of the entire barberry eradication campaign, on July 1. Dr. Kempton received his Master's degree from the University of Wisconsin in 1913 and his Doctor's degree from the University of Illinois in 1918. He taught botany and plant pathology at the University of Illinois for several years and for six months was under appointment in the Office of States Relations Service as Pathologist, at Mayaguex, Porto Rico. Dr. Kempton was introduced to the State Leaders and Assistant State Leaders from the various States, and incidentally to the ways of "New York reporters", at the conference held at Iowa State College on July 10 to 12.

Harold Aase, who assisted with the barberry eradication campaign from April 22 to July 16, 1918, was reappointed Field Assistant in Plant Pathology, effective August 6, 1919, for the barberry campaign in Minnesota, but, on account of accepting a position as high school instructor in Minnesota, he resigned on August 7.

Carl David Adams, who assisted with the barberry eradication campaign in Wisconsin and adjoining states since his appointment on March 21, this year, resigned effective June 30, 1919.

Daniel A. Albrecht, who was recently discharged from the Chemical Warfare Service, was appointed Field Assistant, effective July 1, to assist with the barberry eradication campaign in Illinois. Mr. Albrecht received his Bachelor's degree from the University of Illinois.

Robert V. Allison, who since his appointment effective June 18, this year, has been assisting in the "Take-All" survey, was transferred to the barberry eradication campaign in Ohio, on August 1, 1919.

Louis Anderson, of North Dakota, was appointed Field Assistant in barberry eradication April 7, for assisting in this work in North Dakota. He resigned on June 11 to accept a permanent position in Wahpeton, North Dakota.

Raymond Ellsworth Arp, who was appointed assistant pathologist January 14, for barberry eradication in Colorado and later in South Dakota, resigned on August 6 to accept a position as instructor in Agriculture in an Idaho High School.

Karl D. Bailey, who was discharged from the U. S. Navy in December last year, was appointed Field Assistant for the eradication of the common barberry in Iowa and surrounding States, effective May 16.

Warren G. Baker, of Muscatine, Iowa, was appointed August 25, 1919, as field assistant in Plant Pathology to assist in the barberry campaign in the State of Iowa. He was discharged from the U. S. Army, December 20, 1918. He is a graduate of the Iowa State College, Ames, Iowa.

Victor D. Basart, formerly Assistant County Demonstration Agent in South Dakota, has been appointed Field Assistant in this Office, effective July 1. Mr. Basart will assist with the barberry eradication campaign in North Dakota and surrounding States. He had studied at the North Dakota Agricultural College three years, when he entered service with the U. S. Naval Reserves, from which he has recently been released.

William Emil Bina, who was appointed Field Assistant in barberry eradication for duty in North Dakota on March 8, resigned effective August 10, in order to return to the farm to assist in the harvesting of the wheat crop.

Edwin B. Bothe, was appointed Field Assistant July 1, 1919, for barberry eradication in Minnesota and surrounding States. He received his bachelor of science degree in the University of Minnesota in 1899. He has had practical farming experience and teaching experience in Botany and Biology since that time. He resigned on August 5, 1919, to accept a position as Principal in the High School at Wadena, Minnesota.

Newton C. Brackett, who has been engaged in the smut control campaign, was transferred on August 1 to the barberry eradication campaign in Minnesota, and shortly afterwards to the State of Ohio, where the campaign had just recently been enlarged.

Donald Brazie has been appointed Field Assistant, effective July 1, to assist with the barberry eradication campaign in Iowa. Mr. Brazie was studying at the Iowa State College, when he enlisted with the U. S. Army, from which he received his discharge in November, last year.

William E. Bruner was appointed Field Assistant, effective May 16, for the barberry campaign in Nebraska and surrounding States. During the summer of 1918, Mr. Bruner was under appointment as Field Assistant in the Office of Forest Pathology, to assist with the White Pine Blister Rust eradication.

Frank L. Brunkow, who had been connected with the barberry eradication campaign in the State of Minnesota previous to entering military service in June, 1918, and who was again appointed March 14, 1919, resigned on July 20, 1919, from the position of assistant state leader in Minnesota to take charge of his father's business.

Dawson Hawkins Burwell, who was appointed Field Assistant in the barberry campaign in Colorado on March 17, 1919, resigned August 20, 1919, to continue his studies at the Colorado Agricultural College.

Sanford A. Campbell was appointed as field assistant June 7, 1919, to assist in the Take-all survey in Indiana and surrounding States. On or about August 1, he was transferred to the barberry eradication campaign in Indiana. He had a four-year course in scientific agriculture in Purdue University, having taken his degree in 1919. He was formerly connected with the Bureau of Plant Industry as assistant in the work of tomato disease control.

Glenn W. Carey was appointed Assistant Pathologist, effective May 22, to assist in barberry eradication in Michigan and surrounding States. Mr. Carey received the B.S. degree from Michigan Agricultural College in 1916. He served with the 119th Field Artillery, 32d Division, during the war, and was discharged therefrom on March 18 of this year.

Bret E. Cooley, formerly under appointment as Field Assistant in this Office, was reappointed Field Assistant, effective June 3. As under his prior appointment, Mr. Cooley will assist with the barberry eradication campaign in Minnesota and surrounding States. Mr. Cooley received the B.L. degree from the University of Minnesota.

Stewart R. Cooper, who was formerly employed in the barberry eradication campaign in Iowa under State funds, was appointed field assistant in Plant Pathology on August 22, 1919, to continue his duties in locating and eradicating barberries. He is a graduate of Iowa State College where he received the degree of Bachelor of Scientific Agriculture in 1919.

Raymond F. Crawford of Grand Junction, Iowa, was appointed Field Assistant in Plant Pathology on August 4, for the barberry eradication campaign in Iowa. He received the degree of Bachelor of Scientific Agriculture from the Iowa State College in 1919. He had previously assisted with the barberry eradication campaign from November 5, 1918 to February 4, 1919.

Neil J. Cronin of Andover, Massachusetts, was appointed Field Assistant August 25, to assist in the barberry eradication campaign in Illinois and surrounding States. He graduated from Tilton Seminary after a four-year course and from Georgetown University Law School in 1917 with the degree of L.L.B. He has had several years of practical farm experience.

Walter H. Cudaback of Flint, Michigan, was appointed Field Assistant on August 4, 1919, to assist in barberry eradication in Michigan and adjoining States. He has had three years in the Michigan Agricultural College.

William V. Cutler was appointed Field Assistant in Plant Pathology August 9 1919, to assist in the barberry eradication campaign in Ohio and the surrounding States. He attended Lake Forest College, in Illinois, and later graduated from Maryland State College with the B.S. degree. He entered military service April 1, 1918, and was honorably discharged July 24, 1919.

Henry T. Darlington, who has been Assistant Professor at the Michigan Agricultural College, Department of Botany, for the past five years, was appointed Collaborator on July 1 to assist in the barberry eradication campaign in

Michigan. He attended the University of Idaho four years, receiving the degree of Bachelor of Scientific Agriculture in 1903, and studied one year at Harvard University, receiving his Master's degree therefrom in 1911.

James H. Defandorf of Garrett Park, Maryland, was appointed Field Assistant on August 1, 1919, to assist in barberry eradication in Ohio. He is a graduate of Wesleyan University at Middletown, Connecticut, where he received his A.B. degree in 1915 and his A.M. degree in 1916. He served in the U. S. Army from July 21, 1917 to March 17, 1919.

Leland DeFlon, who was appointed Assistant Pathologist February 15, 1919, and succeeded Dr. Kempton as Assistant State Leader of the barberry campaign in Illinois, resigned August 8, 1919, to return to forestry work.

Miss Mayme Dworak of Oakdale, Nebraska, was appointed Field Assistant in Cereal Investigations on August 21, 1919, for the barberry eradication campaign in Nebraska. She is a graduate in Botany of the University of Nebraska.

Charles L. Farabaugh of Carrolltown, Pennsylvania, was appointed Field Assistant in Plant Pathology on August 9, 1919, for the barberry eradication campaign in Pennsylvania and adjoining States. He is a graduate of the State Normal at West Chester, Pennsylvania, attended Pennsylvania State College four years, receiving his B.S. degree in 1918, and received the Diploma d'Etudes Superieures, University of Paris, 1919. He has been in military service from June 24, 1918 to July 23, 1919, when he was honorably discharged.

Leo Joseph Federer was appointed August 5, 1919, as Field Assistant in Cereal Investigations to assist with the barberry eradication campaign in Wisconsin and surrounding States. He served in the United States Navy from April, 1918, to December 23, 1918, when he was honorably discharged.

Lawrence M. Fenner was appointed Field Assistant July 1, 1919, for barberry eradication in Ohio. He has served with the U. S. Army from May 17, 1918, to February of this year, when he received his honorable discharge.

Jay H. Gage was appointed Assistant in Plant Pathology July 1, 1919, for barberry eradication in Illinois. He has graduated from the University of Illinois, receiving his A.B. degree in 1916, since 1918 he has been a scholar in entomology at the University of Illinois and has completed his work for his Master's degree.

Gilbert D. George received a new appointment as Illustrator on June 2 1919. He will continue publicity features for the barberry eradication. He arrived in Washington August 15, for conference.

Archie Leroy Gibson, who was appointed as Field Assistant June 10, 1919, for Take-all work in the State of Illinois, was transferred to the barberry campaign in Ohio early in August.

George H. Gillespie was transferred August 11 to barberry work in the State of Michigan from the smut prevention campaign.

Bruno Gladewitz was appointed Field Assistant, effective May 19, to assist with the barberry eradication campaign in Michigan.

James Godkin was appointed Assistant Pathologist on April 11, 1919, to assist in the smut-prevention campaign, and was transferred to barberry eradication in Wyoming, early in August.

Dorr D. Green, who was appointed Field Assistant in Plant Pathology, July 10, 1919, to assist in the take-all control in the State of Illinois, was transferred to the barberry campaign in Ohio, on August 1.

Emil F. Guba was appointed Field Assistant in Plant Pathology, effective July 1, for barberry eradication in Illinois. Mr. Guba received his Bachelor's degree from the Massachusetts Agricultural College last June.

Milton C. Gugler was appointed Field Assistant, effective June 1, to assist with the barberry eradication campaign in Wisconsin and adjoining states. Mr. Gugler, who had then been discharged from the U. S. Army recently, received the A. B. degree from Washburn College, Topeka, Kansas, in 1916. He had been employed as Assistant in Botany, part-time, at the University of Wisconsin, since his discharge from the U. S. Army.

Harvey B. Harris, who was given three months leave without pay, beginning May 22, on account of the illness of his mother, resumed his work in the barberry eradication campaign on August 5, and was assigned for work in the State of Wyoming.

Wright L. Hess, who was appointed Field Assistant June 20, 1918, for black rust investigations in Wyoming, was transferred to the barberry campaign on June 20, 1919, as Assistant State Leader in the State of Wyoming.

John F. Holmes, who assisted with barberry eradication in Indiana from April 15 to June 30, 1918, and who was reappointed Assistant Pathologist for black rust investigations on May 8, after his discharge from the U. S. Army, was transferred to barberry eradication again early in July and assigned to South Dakota.

Edwin E. Honey was appointed Field Assistant in Plant Pathology, July 22, 1919, for barberry eradication in Illinois. He is a graduate of Cornell University, and had just recently been discharged from military service, in which he had been since the latter part of 1917.

Harold V. Hoover was appointed Field Assistant on June 11, 1919, for the campaign in South Dakota. He received his B. S. degree from the South Dakota Agricultural College.

Warren J. Hoyt received his appointment as Field Assistant in Plant Pathology effective July 1. Mr. Hoyt, who received his Bachelor's Degree from the Michigan Agricultural College, will assist with the barberry eradication campaign in Michigan. He served with the U. S. Army as Second Lieutenant during the war.

Lynn D. Hutton was appointed Field Assistant, June 7, 1919, for barberry eradication in South Dakota. He completed his course in the South Dakota College of Agriculture last June.

Jacob R. Jacobson, who was discharged from the U. S. Army in April this year, after serving six months with the A. E. F. in France, was appointed Field Assistant, effective May 29, to assist with the barberry eradication campaign in Wisconsin.

Edwin A. Jenner, who from August 19 to September 11, 1918, was Field Assistant in this office, was reappointed Field Assistant effective June 18 this year, to assist with the black rust investigations. From August 1 to 20, he was transferred to the barberry eradication campaign, and on August 21 was assigned to the take-all and flag smut investigations. Mr. Jenner received his M. A. degree from the University of Wisconsin.

P. Denton Joseph, who was discharged from the School of Military Aeronautics, U. S. Ar in December, last year, was appointed Field Assistant effective May 19, 1919. He was assigned to work in Iowa and surrounding states. Since his discharge, Mr. Joseph had been Instructor in the Science Department of the Palmyra High School, Palmyra, Wisconsin.

Ralph E. Kelley, of Michigan, who was appointed Assistant Pathologist for the barberry eradication campaign in Michigan, resigned on September 2, to accept a position with the Western Reserve Academy, Hudson, Ohio.

Walter T. Kelley, who graduated from the Michigan Agricultural College in June, received appointment as Field Assistant in Plant Pathology, effective July 1, for the barberry eradication campaign in Michigan. He served with the U. S. Air Service during the war.

Edwin J. Kepler was appointed Field Assistant in Plant Pathology on July 10, to assist with the take-all and flag smut disease investigations. He was transferred to barberry eradication in Ohio on August 1.

M. B. Kroft, who has been a Field Assistant in barberry eradication since February 17, 1919, resigned on June 30 to accept a permanent position in the Farm Management Department of Kentucky Agricultural College.

William J. Kurtz, who was appointed Assistant Pathologist in the barberry eradication in Michigan, resigned June 26, 1919, to accept a position as Assistant in Dairying at the Experiment Station of the Michigan Agricultural College.

Edmund B. Lambert was appointed Field Assistant, August 4, 1919, for the barberry eradication campaign in Minnesota. He has studied three years in the Minnesota College of Agriculture, specializing in general plant pathology, has worked at eradication of White Pine Blister Rust in Minnesota, and is thoroughly familiar with existing agricultural conditions in Minnesota and adjacent States.

Miss Acelia M. Leach was appointed Field Assistant, effective July 1, to assist Dr. G. H. Coons at East Lansing, Michigan, with laboratory work in connection with the barberry eradication campaign. Miss Leach received the A. B. degree from Kalamazoo College, and during the past year has been studying at Michigan Agricultural College.

Wayne E. Leer was appointed Field Assistant in Plant Pathology, effective July 1, to assist with barberry eradication in Indiana. During the summer of 1918, Mr. Leer was under appointment in this Office as Field Assistant. He received his Bachelor's degree from Purdue University in June, 1919.

F. Bertil Linfield, who has been a Field Assistant since March 17 in barberry eradication in Montana, resigned June 30, to return to his work in the U. S. Geological Survey.

Cedric F. Logan, who was a Field Assistant in the campaign for the eradication of the common barberry in Wisconsin since July 1, this year, resigned on July 18, to accept a position in the Home State Bank, South Milwaukee, Wisconsin.

Hervey A. Lyon, who was appointed Assistant Pathologist on November 26, 1918, after serving as Field Assistant from August 26, 1918, up to that time, resigned on July 31, 1919. Mr. Lyon resigned to return to his trade as painter which was more remunerative work.

Charles N. McIntyre has been appointed Field Assistant in Plant Pathology on July 1, to assist with the barberry eradication campaign in Ohio. Mr. McIntyre received his B. S. degree from the Ohio State University in 1917. He was discharged from the U. S. Army in January of this year.

Peter A. McMillen, who assisted with the barberry eradication campaign in Minnesota during the summer of 1918, was reappointed Field Assistant, effective June 3, for the campaign in Minnesota.

A. W. Marker was appointed Field Assistant, effective June 1, to assist with the barberry eradication campaign in Nebraska and adjoining States. Mr. Marker is a graduate of Northwestern University.

Irwin D. Mayer was appointed Field Assistant in Plant Pathology on August 2, 1919, to assist with the barberry eradication campaign, in Indiana. He received his degree of Bachelor of Scientific Agriculture in 1919, and has served in the U. S. Navy, from which he was released on December 21, 1918.

Allan G. Newhall, who was an agent in this Office from September 25, 1918, to February 19, 1919, was appointed Field Assistant in Cereal Investigations on August 16 for barberry eradication in Nebraska.

Harrison R. Noble, who was appointed Assistant Pathologist on April 26 to assist in the barberry eradication campaign in Wisconsin, resigned on June 15 to return to practical agriculture.

Miss Marie Norman was appointed Stenographer-Typewriter on August 1, 1919, to assist with the clerical work incident to the barberry eradication campaign in Ohio.

Orda Orla A. Plunkett was appointed Field Assistant July 1, 1919, to assist with the barberry eradication campaign in Indiana. He has studied three years in Wabash College, specializing in plant pathology.

Henry Nelson Putnam, who was appointed Assistant in Plant Pathology, on March 21, to assist with the barberry eradication campaign in Michigan, resigned May 31, 1919.

Gail F. Puttick, was appointed Field Assistant in Cereal Investigations on August 23, 1919, for the barberry eradication campaign in Minnesota. He attended the South African College at Cape Town two years, and Cornell University three and one-half years, receiving his B. S. degree in 1918, and has had one year of graduate work at Cornell. He is at present employed as Assistant in Plant Pathology at the University of Minnesota.

Leighton L. Rhodes was appointed Assistant in Plant Pathology, June 7, 1919, for barberry eradication in Iowa. Mr. Rhodes attended Iowa State College four years and received his B. S. degree. He served from December, 1917 to January, 1919 with the U. S. Naval Aviation Forces, having done six months work as seaplane instructor in France.

Clare A. Rood was appointed Field Assistant, effective July 1, for the barberry eradication campaign in Michigan. Mr. Rood worked for the State of Michigan during the summer of 1918 under the State Nursery and Orchard Inspection, on barberry eradication and has studied three years at the Michigan Agricultural College.

Paul H. Rusterholz of Minnesota was appointed Field Assistant, July 26, 1919, to assist with the barberry eradication campaign in Minnesota. He attended McAlister College for four years, then entered the University of Chicago, where he studied for one year. He received his B. A. degree in 1906. He taught agricultural botany in the Red Wing High School, 1912 to 1915, and one year in Central High School, following the completion of his work at the University of Chicago.

J. W. Sanders was appointed Field Assistant on August 12, 1919, for barberry eradication in Ohio. He took four years' work at Clemson Agricultural College, South Carolina, specializing in botany and plant pathology, and received his degree of Bachelor of Scientific Agriculture in 1915. He served with the U. S. Army from January 5, 1918, to July 16, 1919.

Elmer L. Sargent, Assistant State Leader in Colorado since January 4, 1919, resigned on August 12 to take up graduate study at State College, New Brunswick, N. J.

Herman A. Sandhouse, who was appointed Field Assistant April 7, 1919, for the barberry eradication campaign in Colorado, resigned on August 4, to accept a position in Smith-Hughes work in the Logan County, Colorado High School.

James Sazama of Wisconsin was appointed Field Assistant in Plant Pathology to assist with the barberry eradication campaign in Wisconsin, on July 3, 1919. He studied four years in the University of Wisconsin College of Agriculture, receiving the degree of Bachelor of Scientific Agriculture in 1916. He taught agriculture in Darlington High School, 1916 to 1917, and in Barnesville, Minnesota, High School 1917 to 1918. He served as an Ensign in the U. S. Navy from June 22, 1918, to May 15, 1919.

Raymond M. Schenck was appointed Field Assistant, July 5, 1919, for barberry eradication in Michigan. He has attended the Michigan Agricultural College for three years, specializing in plant pathology. He was recently discharged from the U. S. Naval Reserves, where he had served during the recent war.

Ernest R. Schulz has received his appointment as Field Assistant in Plant Pathology, effective July 1. Mr. Schulz will assist with the barberry eradication campaign in Illinois. He received the B. S. degree from the University of Illinois in 1916, his Master's degree in 1917, and his Doctor's degree therefrom in June, this year.

Harry A. Shuder was appointed Field Assistant in Cereal Investigations on August 11 for the barberry eradication campaign in Ohio. He attended Missouri Valley College one year; Drury College, Springfield, Mo., two years, receiving the B. A. degree in 1911; Andover Theological Seminary four years; Harvard Divinity School one year. He was a Chaplain in the U. S. Army for six months and has recently been discharged.

H. C. Severin, State Entomologist of South Dakota, was appointed Collaborator, effective May 16, to assist in directing the barberry eradication campaign in South Dakota, with headquarters at Brookings. Mr. Severin is also a Collaborator with the Federal Horticultural Board and is a graduate of the University of Wisconsin, as well as of the State University of Ohio.

Miss Tryphosa E. Small was appointed Stenographer-Typewriter on August 7, 1919, for office service in the barberry eradication campaign in Illinois.

Frank J. Snider was appointed Field Assistant on July 1, 1919, to assist with the barberry eradication campaign in Iowa. He has had two months' previous experience in barberry eradication work. His appointment was terminated July 21, 1918, when he was called for military service, from which he received his discharge in November 1918. Since then he has been continuing his work at the Iowa Wesleyan College, where he received the degree of Bachelor of Science this June.

Herbert Spencer, who has been assisting in the investigation of take-all and flag smut since his appointment July 10, 1919, was transferred on August 1 to take part in the barberry eradication campaign. He is a graduate of North Carolina Agricultural College, and received his B. S. degree in 1915. Following that he did graduate work at the same college, receiving his M. S. degree in 1917. From July 1, 1918 to the latter part of June this year, he was in the U. S. Army.

George W. Spinning of Michigan was appointed Field Assistant in Plant Pathology on August 4, 1919, for barberry eradication in Michigan. He is a graduate of Michigan Agricultural College in 1916. He served in the U. S. Army from Sept. 6, 1917 to March 6, 1919, as Second Lieutenant.

Enoch D. Sylvester was appointed Field Assistant in Cereal Investigations on August 15, 1919, to assist with the barberry eradication campaign in North Dakota. Mr. Sylvester graduated from the Iowa State Teachers' College with the B. D. degree and from the North Dakota Agricultural College with the B. S. degree. He has had many years experience in teaching botany.

Leon R. Tehon was appointed Assistant Pathologist July 3, 1919, to act as Assistant State Leader of the barberry eradication campaign in Illinois in place of Dr. Kempton. Mr. Tehon received his A. B. degree from the University of Wyoming in 1913 and during part of 1916 and 1917 did graduate work in pathology at the University of Illinois.

Reuben E. Trippensee was appointed Field Assistant on August 4, 1919, for the barberry eradication campaign in Michigan. He studied four years at the Ferris Institute and then entered Michigan Agricultural College where he studied three years. He has had much practical farming experience in Michigan and is familiar with agricultural problems in that section.

Charles W. VanCleve was appointed Field Assistant on August 1, 1919, to assist in barberry eradication in Minnesota. He studied at the University of Kansas, from which he received his A. B. degree, and also studied at the Chicago University during several sessions. For the past five years he has been City Superintendent of Schools at LeSueur, Minnesota.

Alfred C. Vogele, who graduated from the University of Illinois with the B.S. degree in 1918, received his appointment as Field Assistant in Plant Pathology, effective July 1, for the barberry eradication campaign in Illinois. During his course of study at the University of Illinois, Mr. Vogele was Assistant in Botany.

Archie M. Waldie of North Dakota was appointed Field Assistant in Cereal Investigations on August 20, 1919, to assist with the barberry eradication campaign, in North Dakota.

Duane E. Walrath, senior student at the University of Nebraska, was appointed Field Assistant, effective May 21, for the barberry campaign in Nebraska. Mr. Walrath was discharged from the U. S. Air Service in January, this year, where he had served as Second Lieutenant since July, 1917.

George F. Weber was appointed Field Assistant in Plant Pathology on August 15, 1919, to assist in the barberry eradication campaign in Wisconsin. Mr. Weber attended the South Dakota Agricultural College, 1912 to 1916, graduating with the B. S. degree. He entered the U. S. Army in 1916, serving as First Lieutenant and later as Captain with the A. E. F. in France and has just recently been honorably discharged.

John C. West was appointed Field Assistant, effective July 1, to assist with the barberry eradication campaign in Minnesota. Mr. West is a graduate of Fargo College, where he received the B. A. degree. He also studied at North Dakota Agricultural College for one-half year.

Thomas M. Whiteman was appointed Field Assistant on August 1, 1919, for the barberry eradication campaign in Ohio. He studied three and one-half years in Delaware College and has had practical farm experience, and during the summer of 1918 did voluntary work in the eradication of the common barberry in his community. He served in the U. S. Army, from which he was discharged December 19, 1918.

George R. Wildern, who was appointed Field Assistant in Cereal Investigations on December 3, 1918, for barberry eradication in Michigan, resigned on May 10, 1919 to engage in the newspaper business for himself.

Cecil H. Wilkinson was appointed Field Assistant on July 18, 1919, to assist with the barberry eradication campaign in Illinois. He attended Illinois State Normal School four years, 1910 to 1914, following which he entered the Illinois College of Agriculture, where he studied from September, 1916 to April, 1918. From May 10, 1918, to July 5, this year, he served with the U. S. Army as Sergeant.

Simon E. Wolff was appointed Field Assistant in Cereal Investigations, August 4, 1919, to assist in the barberry eradication campaign in Michigan. He attended Michigan Agricultural College three years.

Fred T. Woolverton was appointed Field Assistant on July 1, 1919, to assist with the barberry eradication campaign in Minnesota. He attended the Indiana State University four years, graduating in 1910 with the A. B. degree. He has been Superintendent of the City Schools at Waterville, Minnesota, teacher in the St. Paul Central High School during 1917 to 1918, and City Superintendent of Schools at Akeley, Minnesota, 1918 to 1919.

Crown Rust Project

S. M. Dietz, Assistant Pathologist, who is assisting Dr. Melhus on the investigation of crown rust at the Iowa Experiment Station, spent July and the early part of August on a collecting trip in Iowa and Minnesota.

L. W. Durrell, Collaborator, has been engaged during the season on cooperative laboratory and nursery experiments with the crown rust of oats under the direction of Dr. Melhus at the Iowa Experiment Station.

Dr. I. E. Melhus, Pathologist of the Iowa Experiment Station and in charge of the cooperative investigation of crown rust of oats, spent the month of August in an extended field trip through Minnesota, North Dakota, Montana and the states of the Far West. During this trip, he collected extensive material for use in future experiments.

Miss Florence S. Willey traveled during July in Iowa, Minnesota, and Wisconsin, collecting crown rust material for use in the cooperative green-house experiments conducted at the Iowa Experiment Station.

Leaf Rust Project

Dr. H. S. Jackson, Pathologist of the Indiana Experiment Station and in charge of cooperative investigation of leaf rusts, made a long trip to the Far West during April and May to collect material of the various leaf rusts. During the latter part of May, he was in Washington for conference on future activities in this project. He is assisted in this work at Lafayette, Indiana, by Professor E. B. Mains and Emile Mardfin.

Stripe Rust Project

J. Warren Barber was appointed Field Assistant, effective July 1, to assist with the stripe rust collection and investigation in Idaho, Oregon and Washington. He has studied three and one-half years at the University of Idaho.

John T. Bregger was appointed Assistant in Plant Pathology, effective June 7, to assist with the rust survey in Oregon, Washington and Idaho. Mr. Bregger received the B.S. degree from the Michigan College of Agriculture, following which he studied one year at the Oregon Agricultural College.

John H. Christ, who graduated from the University of Idaho in June, this year, was appointed Field Assistant in Plant Pathology, effective July 1, to assist with the stripe rust collection and investigation in Idaho and adjoining states.

Charles R. Hursh has been engaged during the summer on the survey and collection of material of both black and stripe rusts in the state of California. His headquarters are at the Experiment Station at Berkeley.

Elmer W. Knight who served with the U.S. Army, Medical Corps, during the war, was appointed Assistant Pathologist on May 19, for the investigation and collection of stripe rust in the Pacific Coast States. He is now in Oregon. Mr. Knight received the B.S. degree from the Nevada University in 1918.

Charles E. Owens, who has charge of the investigation of stripe rust in Oregon and adjacent States with headquarters at the State Experiment Station at Corvallis, spent the latter part of August in a survey and collecting trip in the Puget Sound district and British Columbia.

Miss Jessie P. Rose, Laboratory Assistant for Mr. Owens at the Oregon Experiment Station, has been engaged during the summer in identification of the stripe rust material collected by the field men.

SMUT PROJECT PERSONNEL

Dr. George M. Reed left Washington early in June for an extensive trip to inspect the various cereal smut experiments. He attended the Conference of Cereal Pathologists held at St. Louis on June 5, 6, and 7, taking part in the symposium on cereal disease resistance. Following the conference he went to California, and, in company with Prof. W. W. Mackie, inspected the cereal smut plots at Berkeley and Davis. He then visited the Plant Introduction Station at Chico. He spent some time in the field with Field Assistant A. C. Wilcox, inspecting wheat fields in the vicinity of Chico and Nelson, California. Later he spent some time in the field with Field Assistant C. W. Johnson, inspecting grain fields in the vicinity of Corcoran and Hanford, California. After several days spent in California, he proceeded to Oregon, examining the cereal plots at Corvallis and at Moro in company with H. M. Woolman. He then proceeded to Washington and, in company with George L. Zundel, inspected cereal fields in Western Washington, and later the cereal smut experiments at Lind and Pullman. At the latter place he was able to look over the work of Dr. F. D. Heald and Prof. E. F. Gaines. After a short conference with Dr. C. W. Hungerford, at Moscow, Idaho, he proceeded to Aberdeen, Idaho, for the purpose of studying the oat smut experiment at that substation. He found it in excellent condition and the results of the season's work were very promising. Short visits were made at Bozeman, Montana, Fargo, North Dakota, St. Paul, Minnesota, Ames, Iowa, Madison, Wisconsin, Bloomington, Illinois, and LaFayette, Indiana, for the purpose of conferring with the workers at those points. He returned to Washington August 11.

Mrs. Lucille K. Bartholomew spent a busy season at Madison, Wisconsin, conducting experiments on the influence of environmental factors on oat smut infection. Some very interesting data have been obtained.

John C. Bell, Assistant Pathologist, who has been assisting in the cereal smut control and survey in Oregon, resigned on July 10, 1919.

Mr. F. D. Blaine had general supervision of the cereal disease survey during the present season after the departure of Dr. Reed. He remained in Washington most of the time looking after the details of the work. He left Washington for Pittsburg, Pa., about July 2, and conferred with Field Assistants H. K. Vance, J. T. Fowler, and N. C. Brackett on July 3 regarding the survey in Pennsylvania. He left Pittsburg for Ithaca, N. Y., on the evening of July 4, and on July 5 and 7 he conferred with Field Assistants V. F. Tapke, H. L. Lewis, R. A. Carroll, F. T. McFarland, and A. J. Riker regarding the survey in New York. On August 21 he left Washington for an extensive trip in Western Canada, in order to study the barberry and black rust situation in that region.

Newton C. Brackett was engaged on smut control and the cereal disease survey until August 1, when he was transferred to the barberry eradication work. During this period Mr. Brackett did field work in Alabama, Tennessee, Kentucky, Illinois, Pennsylvania, and Minnesota.

Oran C. Boyd who served as Second Lieutenant with the United States Infantry up to January 10, 1919, was appointed Assistant Pathologist, Effective May 24. He is a graduate of the Agricultural College of Oklahoma and did one year's research work at the University of Missouri, where he was a graduate assistant. Mr. Boyd assisted on the smut control cereal disease survey in Missouri, Iowa, and Minnesota. He resigned August 16, expecting to return to the University of Missouri in September.

Fred N. Briggs spent the month of June on the smut control cereal disease survey in Arkansas and Missouri. In July he proceeded to Ames, Iowa, where he obtained the data on the cereal smut experiment at that station, in cooperation with Dr. I. E. Melhus. On the completion of this work he proceeded to Aberdeen, Idaho, to collect the data on the cereal smut plot at that substation.

Raymond S. Bundy was appointed June 13 for smut control and the cereal disease survey. He had been a student at Purdue University. Mr. Bundy worked in Indiana, Wisconsin, and North Dakota. On August 15 he returned to Indiana to assist in carrying out some demonstrations on the hot-water method for the control of loose smut of wheat.

R. A. Carroll assisted on the cereal disease survey in Alabama, Tennessee, Kentucky, Ohio, and New York. Beginning July 21, he spent about three weeks in Washington assisting in the collecting of the data on the cereal smut experiments at Arlington Farm. He left on Sunday, August 10, for a survey of nematode distribution in Georgia.

J. H. Clark, who worked on the survey and smut control demonstration campaign in 1918, was appointed on June 20 for similar work during the current season. He has spent his time largely in Georgia, Virginia, and Maryland. He resigned August 31, after spending the latter part of the month in studying nematode distribution.

Miss Ruth Colvin, who had been assisting Dr. L. O. Kunkel with cytological work in the office of Cotton, Truck and Forage Crop Disease Investigations, was transferred to this Office, effective May 21. During the present season she has taken charge of and identified specimens sent in by the Field Assistants. She has been especially engaged in working out the distribution of the two species of bunt.

Miss Maude Dawson was transferred from Ithaca, New York, where she assisted on the seed treatments to prevent smut, to Washington on May 26. Since then she has been engaged in compiling and tabulating the data collected by the Field Assistants on the cereal disease survey.

J. C. Fischer, who worked on the survey and smut control demonstration campaign in 1918, was appointed on June 20 for similar work during the coming season. He has spent his time largely in Georgia, Virginia, and Maryland. He resigned August 31, after spending the last few weeks in locating nematode distribution.

Miss Marion Griffiths has been engaged during the summer in supervising the cereal smut experiments at Arlington Farm. She left on August 16 for her vacation in Northern Michigan.

James Godkin has assisted in the smut control cereal disease survey in Texas, Oklahoma, and Colorado. On August 1 he was transferred to the barberry eradication campaign in Wyoming.

Dr. John W. Hotson, Associate Professor of Botany in Washington State University, was appointed Field Assistant effective June 1. He has been engaged in the cereal disease survey in Washington and surrounding States. During the latter part of August he was assigned to make special observations in connection with the smut-and-dust-collecting apparatus on thrashing machines.

Prof. G. H. Jensen, of the Department of Botany of the Washington Agricultural College, was appointed on July 7 to assist in the cereal disease survey in Washington and surrounding States. Toward the end of August he also was assigned to special work in connection with the smut-and-dust-collecting apparatus attached to thrashing machines.

Claes W. Johnson continued on the smut control and cereal disease survey in California during the month of June, resigning from the work on June 30.

Giles R. Kerns was appointed on June 23 to assist Mr. H. M. Woolman in collecting the data on the cereal smut experiments at Moro, Oregon. Mr. Kerns has assisted on similar work in previous years. He resigned on August 14.

J. B. Kendrick was appointed on June 1 to assist on smut control and the cereal disease survey in Missouri and Iowa. He was a graduate student at the Iowa Agricultural College. He resigned on July 21 to accept a position in the Indiana Agricultural Experiment Station.

R. A. Langenbacher continued on the smut control and survey throughout the month of June, working in Missouri. He resigned on June 30 to accept the position of County Agent in Butler County, Missouri.

Herdis L. Lewis who was on the smut control campaign last year, was reappointed on June 13 to assist in the work this present season in Ohio, New York, Wisconsin, and Montana. Mr. Lewis came to Washington on August 18 in order to assist in some of the cereal smut experiments at Arlington Farm.

Dr. George W. Martin of Monmouth College, Monmouth, Illinois, who assisted on the smut control work last year, was reappointed June 14 for similar work this year in Illinois and Minnesota. During the latter part of August he went to Nebraska to obtain special information on the prevalence of corn smut.

Prof. Frank T. McFarland who during the summer of 1918 was Field Assistant in the office of Forest Pathology to assist with the white pine blister rust work, was appointed Assistant Pathologist, effective June 1. He aided in the smut control campaign and cereal disease survey in Kentucky, Ohio, New York, Minnesota, and North Dakota. He resigned on August 22 to return to his duties at the University of Kentucky.

Albert J. Riker was appointed Field Assistant, effective June 1, 1919, to assist with the cereal disease survey. He aided in the work in Ohio, New York,

Wisconsin, and Montana. Mr. Riker had been recently discharged from the United States Army, after having spent ten months in France with the A. E. F. He attended the University of Cincinnati two years and Oberlin College two years, receiving his A. B. degree from the latter institution in 1917. He resigned from the work on August 15.

Fred E. Robbins of the Department of Farm Crops of Purdue University was appointed June 15 to assist on the cereal disease survey in Indiana and Wisconsin. Early in August he returned to Indiana to assist in the cooperative work on the hot water treatment of wheat seed. Mr. Robbins served also in the smut control campaign during the season of 1918.

Miss Florence M. Smith was appointed Scientific Assistant effective July 1, 1919. Miss Smith is a graduate of Syracuse University, Syracuse, N. Y. During the season she assisted Miss Colvin in identifying and caring for the specimens of cereal diseases collected by the Field Assistants in the smut control and cereal disease survey.

Horace J. Stevens continued on the survey in California throughout the month of June. During July he assisted Prof. W. W. Mackie in collecting the data on the cereal smut experiments at Davis. He resigned from the work July 31.

Fred J. Stevenson was appointed July 2 to assist on the cereal disease survey in Washington and adjacent States. Early in August he was transferred to Station work at Pullman to aid Prof. E. F. Gaines in collecting the data on the cereal smut experiments.

Victor F. Tapke spent the month of June on survey in Virginia and Maryland. He then returned to New York, aiding in the survey in that State. He also completed his work in connection with the seed treatment project. On August 18 he returned to Washington for a conference with Dr. Reed in connection with developing plans for seed treatment by the hot water method. He left Washington August 29 to continue the work at Shelbyville, Ind., with special reference to utilizing dryers for drying the treated grain.

H. K. Vance was engaged during the summer on smut control and the cereal disease survey in Georgia, Tennessee, Kentucky, and Wisconsin. About the middle of August he proceeded to Indiana to assist on the work in connection with the hot-water method of treating wheat seed.

Hill Williams, who was under appointment in this office during the summer of 1918, assisting with the smut control campaign, was reappointed Field Assistant, effective July 1, for the cereal disease survey in Washington and adjacent States. He received his A. B. degree from Washington State College in 1917.

W. W. Wood spent the summer on smut control and the cereal disease survey in Texas, Oklahoma, Kansas, Nebraska, Iowa, and Minnesota. About the middle of August he was transferred to Indiana to assist on the work connected with the hot-water method of treating wheat seed.

Miss Jessie I. Wood of Mayfield, California, was appointed Herbarium Assistant, effective July 1. She received her A. B. degree from Leland Stanford University in 1915 and her A. M. degree from the same institution in 1916. Miss Wood has been assisting Miss Dawson in compiling and summarizing the data obtained on the cereal disease survey.

A. C. Wilcox continued on the smut control survey in California during the month of June. He resigned June 30 to enter the University of California in order to complete the work for his degree.

H. M. Woolman left Washington early in June. He attended the conference of Cereal Pathologists in St. Louis June 5, 6, and 7, taking part in the symposium on cereal disease resistance. Mr. Woolman then went to Madison, Wisconsin, to study the work in progress there. He made several stops en route to the West, spending a few days at Berkeley, California, in conference with Prof. W. W. Mackie. He reached Oregon early in July, and in company with Dr. Reed inspected the cereal smut plots at Corvallis and Moro. Since then he has been engaged in collecting the data on the various smut experiments in Oregon.

17

OCT 1 - 19
BUREAU

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

- -

Vol. 11. September 10, 1919. No. 16.
Personnel (Sept. 1--10) and Field Station (Aug. 16-31) Issue.

- -

SPECIAL CONTENTS

Cereal Yields, especially wheat, at Akron, Colo.
Wheat and rye yields at Brookings, S. Dak.
Wheat, oat, and barley yields at Mandan, N. Dak.
Winter and spring wheat yields at Nephi, Utah.
Wheat, oat and barley yields at Moro, Oregon.

PERSONNEL

Robert V. Allison, who was transferred to the barberry eradication campaign in Ohio after two and one-half months service in connection with the investigation and control of take-all, resigned effective September 8 to continue his studies at Purdue University where he previously had been a student for three years.

Edwin S. Baker, Messenger, since June 6, resigned effective September 7, to return to his former place of residence in New Orleans.

Ira L. Baldwin, who has been assisting Dr. Carr with the cooperative corn root and stalk disease investigations at Purdue University Experiment Station, resigned on September 10.

Victor D. Basart, who has assisted in the barberry campaign in South Dakota since July 2, left the work September 6, presumably to return to his studies at South Dakota State College.

Sarkis Boshnakian, who has been engaged during the summer on black stem rust investigation and survey, has completed that work and was transferred early in September to corn rot investigations at Bloomington, Illinois, under J. R. Holbert.

Sanford H. Campbell, who was transferred from the take-all survey in Indiana to barberry eradication in that State on August 12, resigned August 30 to accept a position as instructor in an Indiana high school.

Charles E. Chambliss, Agronomist in Charge of Rice Investigations, returned to Washington from his trip to Porto Rico and the Dominican Republic on September 2.

During the first week after his arrival at San Juan, Mr. Chambliss inspected his experimental work on the sugar estate at Yabucoa, Fajardo, and Canovanus and conferred with parties interested in the development of a rice industry in Porto Rico. On July 5 he sailed for Santo Domingo. Accompanied by Mr. Holger Johansen, Director of the Agricultural Department of the Dominican Government, he visited the Provinces of Azua, La Vega, Santo Domingo, Santiago, Monte Christi, and Purto Plata, to study the methods that are used by the Dominicans in producing rice for home use, and to collect the native varieties. He spent several days at the Dominican Agricultural Station, Jaina, studying the rices collected by him last year, which are being grown in a nursery according to his method. He returns with a large collection of pictures taken by him to illustrate the rice culture and other agricultural practices of the Republic.

Upon his return to Porto Rico, he spent one week at Mayaguez, studying his nurseries of irrigated and non-irrigated rices. He also visited several mountain sections where collaborators of the Porto Rican Station are testing rices and new cultural methods under his instructions.

L. S. Cheney, in charge of studies of epidemiology of black rust in the Wisconsin district with headquarters at Barron, has been engaged in rust studies in Indiana throughout August.

F. A. Coffman, Scientific Assistant in Charge of Cereal Investigations at the Akron Field Station, Akron, Ohio, was married last June and returned to the field station with his bride on June 18. While engaged in threshing of cereals in August, Mr. Coffman had a finger painfully injured in the separator.

Dr. Henry S. Conard, Field Assistant in black rust investigations, resigned effective August 31 to resume his duties as Professor of Botany at Grinnell College, Grinnell, Iowa.

Dr. R. O. Cromwell, who was transferred to this office from the Office of Cotton, Truck and Forage-Crop Diseases on July 1 and who has been engaged in the cereal disease survey, was transferred about September 1 to a study of Septoria species affecting cereals, with headquarters at Iowa State College.

Lawrence M. Fenner, who was appointed Field Assistant July 1, 1919 for barberry eradication in Ohio, resigned September 13 to resume his studies at the Ohio State University, Columbus, Ohio.

Mrs. Judith M. Fishburn returned on September 3 from a vacation spent in the mountains of North Carolina.

Victor H. Florell, in Charge of Cereal Investigations at the Plant Introduction Station, Chico, California, who has been engaged in the wheat breeding and classification nurseries at Corvallis and Moro, Oregon, during the past several weeks, visited the experiment stations and other points in the State of Washington, from August 28 to September 3. He expects to finish his studies of the wheat classification nursery at the Oregon Experiment Station and return to Chico about September 15.

Karl M. Fradenburg, who has been employed in barberry eradication in Nebraska during the summer is resigning on September 16 to return to his studies at the Nebraska Agricultural College. He was engaged in the smut control campaign all last year.

Miss Laura R. Gartrell returned on September 3 from vacation spent at Cape May, N. J.

Dr. Joseph C. Gilman was appointed Collaborator effective August 29.

Frank C. Grannis was appointed August 5 to succeed Stephen N. Spangler as Assistant in charge of the cooperativecereal experiments at the Tennessee Experiment Station, Knoxville, Tennessee. Mr. Grannis graduated from the University of Illinois in 1910, and for the past several months has been a plot assistant at the University of Tennessee.

Randolph O. Helland, who has been in barberry eradication in South Dakota since May, left that work for a short vacation on September 6. He will return to his former work with the United States Geological Survey on October 1.

Richard M. Holman resigned on September 6, as Field Assistant, to resume his position as Instructor at Wabash College. Since his appointment, Mr. Holman has been engaged on black rust investigations.

Harold B. Hoover has accepted a position in the High School at Marshall, Minnesota, and resigned from the barberry eradication in South Dakota on September 2.

Dr. H. B. Humphrey, Pathologist in Charge of Cereal Disease Investigations, returned to Washington on September 7 from a long trip, beginning July 27, to inspect and supervise cooperative field experiments on field diseases.

Dr. Humphrey returned on the 7th from a forty-three days' trip in the field. During his absence he visited the following points: St. Paul, Fargo, Mandan, Pullman, Moscow, Yakima, Puyallup, Friday Harbor, Corvallis, Berkeley, Bloomington, LaFayette, and Madison. At all of these places with the exception of Moscow, Yakima, Puyallup, and Friday Harbor, the office is carrying on cooperative research on cereal diseases. At St. Paul we are chiefly concerned with stem rust investigations. At Fargo and Mandan there is in progress important work on the diseases of flax. At Pullman, the office is cooperating with the Washington Experiment Station in the investigation of bunt or stinking smut. Work on the investigation of this smut is also in progress at Corvallis where, in addition to cur studies on the smut problem, we are also carrying on important studies in the investigation of stripe rust. During the past year, we have undertaken cereal disease research in cooperation with the California Experiment Station. Here we are chiefly concerned with the investigation of stem rust of wheat and oats and the leaf rust of barley. Extensive varietal tests of resistance to the stinking smut of wheat and the covered smut of barley will also be carried on during the coming year. At Bloomington and LaFayette our work is confined chiefly to the investigation of the corn root, stalk, and ear rots and to the study of the relation of these to scab of wheat, oats, barley, and rye. Similar work is in progress at Madison, where we are also investigating the Helminthosporium diseases of barley, ergot of rye and other cereals, and certain aspects of the stem rust problem.

During the course of his trip, Dr. Humphrey held conferences at the various cooperative stations and assisted in formulating plans for research on various problems under consideration. He also had opportunity to get into the field at various points in Minnesota, Dakotas, Washington, Oregon, and California, and was able to get much first hand information concerning the scab and stem rust epidemics in the Central West and the occurrence of smut in the Pacific Northwest. It was gratifying to learn that throughout the Pacific Northwest the damage resulting from bunt was this year unusually light. This scarcity of stinking smut is partly attributable to the effective campaign conducted in the States of Washington, Oregon, and Idaho by members of our smut campaign staff. News was heard of the occurrence of considerable smut south of the Snake River in southeastern Washington where, up to August 20, there had occurred more than twenty smut explosions and fires. One of these reported explosions occurred in the case of a combined harvester, which resulted in the explosion of a tank of gasoline and cremation of nine mules. At Bloomington Dr. Humphrey attended a conference of corn disease workers, during which he had opportunity to note the excellent progress that is being made on the farms of the Funk Brothers Seed Company, where we are conducting extensive field plot experiments.

Edwin A. Jenner, who has been engaged for the past few weeks on the take-all control campaign, and more recently on barberry eradication, resigned on September 2 to accept a position on the faculty of the State Normal School at La Crosse, Wisconsin.

Miss T. Enid King left Washington September 6 for vacation at her home in Columbus, Ohio. She expects to return September 25.

Corland D. Little, Chief Clerk of the Office, has been taking a brief but well-earned vacation from September 9 to 14, inclusive. Mr. Little has been working steadily, day and night, for many months.

Miss Mildred B. Longyear, who has been employed in the War Department, was appointed clerk in this Office effective August 29 for service at Purdue Experiment Station at Lafayette, Ind., under Dr. G. N. Hoffer, in the investigation of corn rots. She had been working there under Dr. Hoffer's authorization since August 1.

John H. Martin, Scientific Assistant in Western Wheat Investigations, has completed his field investigations for the season and returned to Washington on September 4.

Mrs. Pansy D. McKinney, stationed at Madison, Wisconsin, in connection with the cooperative investigations of cereal diseases conducted at the Wisconsin Experiment Station, is on leave from September 5 to 17, inclusive.

Charles Wm. McLain, Field Assistant, who has been assisting with the barberry eradication campaign in Colorado, resigned on August 19 to continue his work at the Colorado Agricultural College.

Leonard W. Melander was appointed Field Assistant effective August 4, to assist with the general black stem rust investigation carried on in cooperation with the Minnesota Agricultural Experiment Station. Mr. Melander has studied two years at the University of Minnesota and served one year as laboratory and field assistant in the Department of Plant Pathology. He was discharged recently from the U.S. Army, having served with the 351st Infantry.

Miss Ada D. Miller returned to the Office on September 8 from a vacation spent at her home in Mississippi.

George F. Miller, who from September 19 to December 15, 1917, was Field Assistant in this Office, in connection with the smut control campaign was appointed Field Assistant effective September 10, to assist with the investigations of nematode of wheat in Virginia and West Virginia. Mr. Miller received his Bachelor's degree from the Michigan Agricultural College in June, 1917.

Benton E. Rothgeb, Scientific Assistant in Charge of Grain Sorghum and Broom Corn Investigations, has been making a round trip of the more important field stations in Kansas, Oklahoma, Texas and New Mexico, with Professor J. H. Parker of the Kansas Experiment Station, with a view to more intensive breeding investigations. He finished this portion of his trip at the Kansas Station on September 8 and left for the Woodward Field Station at Woodworth, Oklahoma, and the Amarillo Field Station at Amarillo, Texas. He will be at Amarillo most of the time until about September 20, when he expects to return to the office. He reports that the grain sorghum crop in those States is generally good, though some Kafir is late in maturing and may yet be caught by frost.

James Sazama, who was appointed field assistant in plant pathology in Cereal Investigations on July 3, resigned August 31 to accept a position as instructor in agriculture in the Bagley High School at Bagley, Minnesota.

Kercheval E. Smith, a graduate of the Maryland Agricultural College in 1916, was appointed field assistant on September 9 to engage in the investigation of the distribution of the wheat nematode in Maryland and Virginia.

Miss Virginia B. Smith returned on September 8 from a vacation period spent at Wildwood, N. J.

Stephen N. Spangler, Assistant in charge of the cooperative cereal experiments at the Tennessee Experiment Station, resigned on June 10 on account of illness and was succeeded on August 5 by Frank C. Grannis.

Herbert Spencer, who was appointed Field Assistant in Plant Pathology on July 1, resigned on September 2 to resume his position as Instructor in Zoology and Entomology at the North Carolina Agricultural College.

Lewis J. Stadler, Assistant in Farm Crops and Agent in charge of our cooperative investigations at the Missouri Experiment Station, was an office visitor on September 11, enroute home from a period of study at Cornell University.

John W. Taylor of Bellows Falls, Vermont, a graduate of the New Hampshire Agricultural College, and who took post-graduate work in farm crops at Ohio University, was appointed effective September 1 to engage in the investigation of wheat nematode in Virginia and West Virginia. He was employed in the Office during the summer of 1918 in connection with the smut control investigation, and later entered military service. He arrived in Washington on September 11.

Clyde W. Warburton, Agronomist in Charge of Oat Investigations, who has been stationed at Great Falls, Montana, for more than a year in connection with the application of the President's seed loan fund to settlers in drouth stricken districts, expects to complete his work there very shortly. During the week of September 7 to 13, he visited the experiment stations at Pullman and Lind, Washington, and Moscow, Idaho, conferred at Spokane, Washington, with Judge Lobdell of the Farm Loan Board, and President O'Shea of the Spokane Federal Land Bank, and returned to Great Falls on September, expecting to pack up and return to Washington about September 25.

Mr. George F. Weber, who was appointed for barberry eradication in Wisconsin on August 15, 1919, was transferred to Corn Root and Stalk Disease Investigations on September 8.

Dr. Orland E. White, Botanist of the Brooklyn Botanical Garden, was appointed field assistant under date of August 20 to collect seed of wild grasses and rust species occurring on grass plants in the Northeast United States. This material is to be used in the study of biologic forms and the relation of wild hosts to the distribution of cereal rusts.

Miss Grace O. Wineland, Scientific Assistant, stationed at Madison, Wisconsin, in connection with the cooperative cereal disease investigations at the Wisconsin Experiment Station, was on vacation from August 13 to September 1, inclusive.

Professor C. M. Woodworth, Pathologist in cooperative investigations of breeding flax for disease resistance left the Northern Great Plains Field Station at Mandan, North Dakota, on September 3 and reached his permanent station at Madison, Wisconsin, after spending a brief time at the North Dakota and Minnesota stations enroute. He was accompanied by Mrs. Anna Woodworth who has been under

temporary appointment as field assistant in connection with the taking of genetic notes in the flax breeding experiment.

VISITORS

Dr. E. D. Ball, State Entomologist of Iowa and Collaborator in the barberry eradication campaign in that State, was an office visitor on September 3 and 4 while enroute from a conference at Albany, New York, on the outbreak of European corn borer in the Northeastern States.

Dr. King Miyabe, Professor of Botany at the Hokkaida Imperial University, Sapporo, Japan, visited the Office some weeks ago to discuss cereal crops.

Felix J. Schneiderhan, formerly of this office and then recently discharged from the Gas Defense Service, visited the Office of Cereal Investigations June 5. He is now employed by Scott & Company, Inc., of Wilmington, Del., in the capacity of Farm Manager of a 1200-acre country estate. This farm has all modern equipment, including two gas tractors and milking machine. The cropping scheme is divided into a 3-year rotation of alfalfa, corn and wheat. There are registered herds of Angus, Guernsey, and Holstein cattle, and Duroc-Jersey hogs. The labor is carried on entirely by colored help. Mr. Schneiderhan came through Washington from southern Virginia, where he had been buying some high-class registered stock.

Professor M. B. Smits of the Department of Agriculture at Buitenzorg, Java, is spending several months in the United States, studying the culture, improvement, and commercial handling of the rice crop. He has spent several weeks in California and was a recent visitor at the Office in Washington. Early in September he went to Louisiana, where he will spend another period of time at the Crowley Rice Station and in the producing districts in that State and Texas.

Director Bonney Youngblood, of the Texas Experiment Stations, was an office visitor in August.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley. (J. Mitchell Jenkins). The lowest temperature during the month was 70 degrees on the 19th, and the highest was 92 degrees on the 17th and 27th. The total precipitation for the month was 4.48 inches, and the greatest precipitation in 24 hours was 1.67 inches on the 21st.

Most of the rice varieties in nursery are heading. Harvest will begin about the second week in September. We have succeeded in cleaning the plats and are now at work on the drainage ditches.

Farmers are harvesting early rice, and some threshing has been done in this section.

GEORGIA

State Experiment Station (Athens) and Substations. (R. R. Childs). No report.

TENNESSEE

State Experiment Station, Knoxville, and Substation, Jackson. (C. A. Mooers). No report.

NORTH CAROLINA

State Experiment Station, West Raleigh, and Substations. (G. M. Garren). No report.

VIRGINIA

Arlington Farm, Roslyn (Dr. Leighty). No report.

NEW YORK

Cornell Experiment Station, Ithaca. (H. H. Love). During the month of August there has been considerable cool weather accompanied by cloudiness. Occasional rains have fallen, but in many places there has not been sufficient moisture for the best growth of crops. In the northern part of the state where the farmers are considerably interested in oat-growing, oats have ripened rather late on account of the late seeding, and are rather badly infested with rust. During the month, the various oat plats have been harvested and demonstration meetings with farmers have been held. This work was done in Schoharie, Madison, Lewis, Franklin, St. Lawrence, Jefferson, Onondaga and Ontario Counties. Some very interesting results have been obtained. In these various plats the best commercial varieties were compared with the new strains produced through selection. The yields are not yet all available but will be reported at a later time. Most of the month has been taken up in harvesting oat hybrids, and sorting these in their different categories in order to determine the segregation of the various characters.

The thrashing of the wheat has been completed and the notes are being taken preparatory for the fall seeding. There is considerable demand for seed of the new strains of the various small grains. During the month Mr. J. A. Clark stopped for consultation on his return trip to Washington. Mr. C. H. Clark, now with the Albert Dickinson Company, also visited the department.

MISSOURI

State Experiment Station, Columbia (L. J. Stadler). No report.

IOWA

State Experiment Station, Ames (L. C. Burnett). (Aug. 3). Thrashing has proceeded during the week. The Station plats of winter wheat are making from 35 to 40 bushels. Oats are low in yield and poor in quality.

(Sept. 6.). There has been no rain during the past 3 weeks. The hot dry winds have been very severe on the new fall seedings of alfalfa. It will be hard to fit land for fall wheat without rain.

GREAT PLAINS AREA (South to North)

TEXAS

Amarillo Cereal Field Station, Amarillo. (John F. Ross). There was no report for the first half of August as the superintendent and family were away on vacation.

The weather data for the month of August is as follows: Maximum temperature

102° on the 6th; minimum 58° on the 31st; average hourly wind velocity 5.5 miles; precipitation 3.43 inches, the most of which came on the 7th and 8th (1.55 on 7th and 1.09 on 8th). The remainder came in scattered showers; and evaporation 8.459 inches.

The first week of the month was very dry but the good rains on the 7th and 8th came in time to do the row crops great good. The month ended quite dry also, but row crops are not suffering yet.

The grain sorghums give promise of excellent yields this year. The earlier varieties like the brown kaoliangs, milo and feterita are ripening rapidly now.

No threshing of the small grains has been done yet on the station. A large per cent of the wheat in the surrounding country is yielding near twenty bushels per acre. Oats are reported to be yielding from fifty to seventy bushels, and a few farmers report considerably higher yields than that.

We have had a hard fight with the weeds on account of lack of help and teams at the proper time. Nearly all the ground for fall seeding has already been prepared and is in very good condition.

Visitors at the station during the month were H. P. Gould, B. E. Rothgeb, John H. Parker, B. F. Brandon and Wallace Butler.

Mr. L. F. Locke of the Office of Dry Land Agriculture is now on vacation with his family in New Mexico.

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). August of this year has been drier than the average as the rainfall was but 1.87 inches compared with a 24-year average of 2.97 inches. The rainfall for August this year came in such small quantities that it did little more than cool the atmosphere.

The maximum temperature for August was 104° on August 15, and the minimum was 64° on August 9, 10, and 31. The precipitation for the month was 0.16 inches on Aug. 2, 0.78 on Aug. 7 0.02 on Aug. 8, 0.54 on Aug 18, 0.11 on Aug. 20, 0.06 on Aug. 29, and 0.20 on Aug. 30, a total for the month of 1.87 inches.

During the last half of the month, sorghums have been ripening rapidly because of the dry conditions of the soil and air.

Broomcorn harvest is almost completed, as but one of the varietal plats and the three last date-of-seeding plats yet remain to be harvested. The rate-of-seeding plats, which were harvested August 25, will make rather good yields of brush. From all indications, the varietal plats of broomcorn will make average yields.

The four earlier date-of-seeding plats of red amber sorgo were harvested August 23. Next week some of the earlier varieties of the varietal experiment and the early dates of sorghum will be harvested.

Mr. Rothgeb visited the station from August 24 to 26 and was joined here on the 26th by Mr. John H. Parker of the Kansas State Agricultural College. Both left on the 26th for a trip through Texas, New Mexico, and Western Kansas.

KANSAS

Fort Hays Branch Station, Hays (A. F. Swanson). The weather continues dry, there having been less than an inch of rain during the entire month of August.

Most of the work just now on the Cereal Project is being directed on the sorghums. All guard rows will be cut today and ripe varieties of feterita harvested. Head rows of Freed, Blackhull kafir, Dwarf Yellow milo and feterita are ripe and considerable seed has been collected.

Within the last few days it has been noted that Blackhull kafir is being rather seriously infected by what is probably the fall army worm. These worms work in the compact heads and are found as the seed ripens.

Information from farmers indicate that there will be a less acreage of wheat seeded this year than last year. The high cost of raising wheat, due to excessive wages and the uncertainty of next year's prices, has put a damper on extensive seedings. There is also the tendency of the farmers to put in the wheat by the cheapest method possible.

Saturday, September 6, the Station will have "Sorghum Day" to which the public is invited to inspect the sorghums growing on the Projects and in the commercial fields. A good attendance is expected.

President Jardine of K. S. A. C. visited the station last week. Dean Farrell of the Division of Agriculture, K. S. A. C. will be here Sept. 2.

State Experiment Station, Manhattan (John H. Parker) No report.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). August, at Akron, was a record-breaking month as far as precipitation was concerned. The total precipitation for the month was 0.44 inches, the lowest precipitation ever recorded for a summer month at Akron Field Station, the nearest approach being 0.86 inches in August, 1905.

Our total precipitation from June 5 to August 31, 87 days, was 2.91 inches, of which 1.23 inches came in two showers of over ½ inch each on July 3 and 4. At no other time since June 4 has a precipitation of as much as ½ inch been received. Only one precipitation of over 1 inch has been received so far this year. A rain and snow of 1.24 inches came June 4. The total precipitation so far this year has been 9.14 inches. This is but 0.14 inches more than was received during the first nine months of 1911, our driest year at Akron Field Station.

After reviewing the weather conditions for the past season it is surprising that the average yields in Eastern Colorado should be so high. One farmer is reported to have secured an average of 27 bu. per acre from 320 acres of fall wheat on sod land. The average yield of fall wheat in this section was possibly between 10 and 15 bushels.

At the present time farmers are unable to deliver their wheat to the elevators due to a car shortage. Thousands of bushels of wheat still remain on the farms and owners of trucks have discontinued hauling.

Corn and forage crops withstood to a surprising degree the dry weather up until the last week or ten days of August. At that time these crops began to suddenly turn prematurely ripe and much of the corn and sorghum has been cut. The average corn yield in this portion of the State will probably be between 10 and 15 bushels. Sorghums, sudan, millets, and potatoes are light crops this year but are better than might be expected under the conditions. Millets and potatoes are possibly the nearest to a complete failure of any of the list.

At Akron Field Station some very good yields were secured this season. Supt. Grace, of the Office of Dry Land Agriculture, secured a yield of 47.5 bushels to the acre from a plat of Kherson oats (C.I.459), and Coast barley (C.I.690) yielded about 30 bushels on the same soil treatment. Five acres of Kanred winter wheat (C.I.5146), part on fallow and part on wheat ground, averaged about 34.5 bu. to the acre, while two acres of Kharkov fall wheat (C.I.1583) produced only about 27.5 bu.. Kanred, therefore, yielded about 7 bushels to the acre more than Kharkov.

A plot of spring wheat, Prelude (C.I.4323) on the Office project yielded 18.75 bushels to the acre on land cropped to corn the previous season. The average yield of all our spring wheat varieties was 7.29 bushels to the acre. The yields of the spring wheats by groups at Akron were as follows:

Durums	12 varieties	Average yield	6.11 Bu.
Fifes	4 "	" "	6.28 "
Prestons	4 "	" "	10.95 "
Bluestems	1 "	" "	2.75 "
Miscellaneous	3 "	" "	9.85 "

Golden Ball, a spring durum (C.I. 6227), a recent introduction from Africa, gives considerable promise. This variety, though unacclimated, yielded as much as our best yielding durums.

In our oats experiments a new variety from Nebraska, Nebraska No. 21 (C.I. 841), produced 14.04 bu. to the acre, the best yield of the early varieties. Black American, a medium early variety, not grown at Akron for several years, yielded 17.55 Bu. The midseason and late varieties produced very poor yields.

The yields of barley were very poor. Blackhull (C.I. 878), an early two-row variety, produced the best yield, averaging about 20 bushels per acre.

The stands secured from the seedings of proso, millet, kaoliang, and buckwheat were exceedingly poor. As the weeds are so thick it probably will be of little use to try to secure any experimental data from the varietal plats of proso, millet and buckwheat.

The first seedings in the winter wheat combination rate and date experiment were sown August 16. Despite the extremely dry condition of the soil some emergence has taken place.

During the past month a new office chair and a nursery thrasher have been added to the equipment of the Cereal Office at Akron.

Mr. H. P. Gould of Washington, D. C., Mr. A. C. Dillman of the Mandan, North Dakota, Station, and Mr. L. L. Zook of the North Platte, Nebraska, Station were Department of Agriculture visitors at Akron Field Station during August. Prof. W. W. Robbins of the Colorado Agricultural College also visited the station during the month.

Preliminary Report of Spring Wheat Yields at Akron Field Station, 1919. Yields are from fiftieth-acre plats replicated four times, twice on fallow and twice on corn stubble, except where indicated by an *.

A. Durum Wheats

1. Kubanka group.

Variety	C. I. No.	Bu.	Variety	C. I. No.	Bu.
Arnautka	1493	8.67	Arnautka	1493-7-12	3.40
Arnautka	4064	5.42	Taganrog	1570	4.25
Beloturka	1520	8.34	Beloturka	1520-3-09	2.57
Kubanka	1440	5.91	Pererodka	3072	2.07
Monad	3320	8.68			

2. Pelissier group.

Peliss	1584	8.68			

3. Red Durum group.

D-5	3322	6.49			

4. Miscellaneous Durum group.

Golden Ball	6227	8.83			

B. Common Wheats

1. Fife group.

Ghirka	1517	7.58	Power	3697	4.75
Marquis	3641	8.54	Glyndon	2873	4.25

2. Preston group.

Pioneer	4324	13.83	Preston	3081	5.89
Converse	4141	11.16	Erivan	2897	12.92

3. Bluestem group.

Haynes	2874	2.75			

4. Miscellaneous group.

Galgalos	2398	5.83	Laramie	6235	5.58
Prelude	4323	18.13			

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson). The month of August has been full of extremes. The fore part of the month was quite damp. The total precipitation, 1.19 inches, came during the first 15 days. A hail storm, which occurred August 7, did considerable damage to crops, especially the oat crop. The early varieties, which were about ready to harvest, were practically all shattered out, while about 60 to 70 per cent of the midseason varieties were shattered. During this period there was an unusual development of rust which has almost ruined the common spring wheat. The winter wheats escaped this infection and the durum varieties were not so severely affected.

The last half of the month has been absolutely dry with a couple of severe winds carrying great quantities of dust. These winds were very destructive to the common spring wheats and early varieties of oats. Whole shocks of these varieties of grain were removed entirely from the field and many varieties were badly mixed. After each storm, reconstruction was made as far as possible.

The harvesting of all cereals has been accomplished except varieties of flax and late date-of-seedings of spring grain. All winter and common spring wheats, as well as all Dry land project grains, have been threshed.

The highest yield of winter wheat on any one plat, 13.5 bushels per acre, was produced by Kanred, C.I. No. 5146. The winter wheat is of fair to good quality. The highest yield of common spring wheat on any one plat, 7.16 bushels per acre, was produced by Erivan, C.I. No. 2379, Galgalos taking second place. The average yields of the common spring wheats are very low and the grain so shriveled that it is doubtful whether it will do for seed purposes.

Sheridan Field Station, Sheridan (Leroy D. Willey). No report.

SOUTH DAKOTA

Bellefourche Experiment Farm, Newell (A. D. Ellison). The weather for the last half of August continued generally fair, with a marked change to cooler weather. The small amount of rain that fell was of practically no importance. Maximum temperature was 97 degrees; minimum, 42 degrees; precipitation, 0.06 of an inch.

The work of thrashing nursery material has been completed. Profitable yields were obtained from practically all the cereal varieties and selections grown in the nursery under irrigation. Small yields were obtained from spring wheat varieties grown in the nursery under dry land conditions, while the oat, barley, and flax seed in the dry land nursery were failures. The work of fanning and cleaning cereal varieties is under way and preparations are being made to seed fall-sown crops.

The game of tennis has been a source of much pleasure during the summer, the court on the farm having been put in shape for playing. Many good fishing trips to Arman dam, the supply reservoir for the Bellefourche Project, have been enjoyed. The Labor Day celebration held at Newell on Sept. 1 was well attended and all present seemed to enjoy the occasion.

Cottonwood Substation, Cottonwood (Manley Champlin). Threshing is about completed. The quality of the wheat and other crops is very good, there being very little evidence of plant diseases. Threshing reports are not in yet. Mr. Hinsvark, the farm foreman, was hurt in a runaway and is suffering a sprained ankle, but is rapidly recovering.

Vivian Substation Vivian (Manley Champlin). Rye and barley threshing is about completed. All grains that are not threshed are stacked. Silo filling was begun during the past week. Corn is unusually early.

Eureka Substation, Eureka (Manley Champlin). Threshing is about complete. Yields and quality of small grain crops are good. Foreman Sutherland attended the tractor show at Aberdeen during the third week in August. Mr. George Janssen, assistant in farm crops, visited the station on the 22nd.

Highmore Substation, Highmore (H. S. McFadden). No report.

State Experiment Station, Brookings (Manley Champlin). Threshing has been completed during the month. Yields of wheat are relatively low because of scab and other plant diseases. Results of the varietal experiments with wheat and rye are as follows:

Winter wheat

Name	S. D. No.	C. I. No.	Bu. per Acre
Kanred	1098	5146	22.5
Kansas	1178	5880	20
Kansas	1177	5879	20
Turkey	144	3689	15
Turkey (Neb.6)	1137	6249	13.3
Turkey (Neb.60)	1138	6250	13.3
Kharkov	191	1442	12.5
Red Rock	1176	5976	7.5

Common Spring wheat

Kota	1184	5878	5.86
Pioneer	1082	4324	5
Marquis	515	3641	3.3
Prelude	1021	4323	2.5
Glyndon	163	2873	1.66
Power	1039	3697	1.2
Preston	67	3081	.83
Haynes	169	2874	0.41
Marquis (Wis.Improved)	1188		0.41
Ghirka	69	1517	0

Durum Spring wheat

D5	1112	3322	10.3
Kubanka	75	1440	10
Monad	1113	3320	9.01
Acme	284	5284	8.3
Kubanka	1019	4063	7.5
Buford	1159	5295	7.5

Mindum	1160	5296	7.5
Pierson	999	4163	6.6
Sloat	1158	6046	5
Kubanka Sel.	75-3-15		5
Arnautka	1001	4064	1.60
Castilione	1132	5539	1.6

Winter Rye

Swedish	348		23.2
Advance	1030	5109	21.5
Rosen	1175		21.5
Wis. No. 1	1179		20.5
Dean	177	181	16.9

General. The corn crop is unusually good this year and in most localities would not be seriously injured if frost were to occur in the near future. At Highmore Substation the seed corn has already been selected. At the other stations seed corn selection will begin in a few days. The State Corn and Grain Growers' Association are advertising the first week in September as seed corn week this year. Pastures are in unusually good condition. The wheat crop is very poor in the eastern section, but early oats and barley are producing fair yields and rye is good wherever a good stand was obtained.

NORTH DAKOTA

State Experiment Station, Agricultural College (Theodore Stoa). No report.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). The maximum temperature for the month was 100°, recorded Aug. 4; minimum 46°, recorded Aug. 25.

During the last half of August there has been no rain. Between Aug. 4 and 16, however, rains amounting to 1.22 inches, though coming after all small grains were harvested, were of considerable benefit to corn and forage crops. They served, however, to prolong further the blooming period of flax so that ripening was irregular as in the last two years. The stems remained green, producing new bolls continuously, so that the whole crop did not ripen at any one time, making it difficult to estimate the harvest date on which best yields might be obtained. Many ripe bolls were being nipped off by the enormous flock of grasshoppers so that the significance of possible yield data seems questionable. Poison distributed August 13 seemed to kill a good many hoppers but apparently did not reduce the number. The first flax was harvested Aug. 11, and by Aug. 30 all plats were harvested except the June 15 date of seeding.

Cereal varieties were threshed Aug. 21 and 22, and yields are as follows:

WHEAT

Acme	C. I. 5284	17.2
Preston	C. I. 3081	15.9
Marquis	C. I. 3641	14.6
Power	C. I. 3697	14.4
Haynes	C. I. 2874	12.8
Arnautka	C. I. 4064	12.0
Kubanka	C. I. 4063	12.0

OATS

Sixty Day	C. I. 165	24.3
Golden Rain	C. I. 493	22.0
Early Mountain	C. I. 656	20.1
Victory	C. I. 560	18.7
Swedish Select	C. I. 134	18.6
White Russian	C. I. 551	18.0

BARLEY

White Smryna	C. I. 195	23.9
Hannchen	C. I. 531	22.5
Svanhals	C. I. 187	20.6
Coast	C. I. 690	19.3
Manchuria	C. I. 354	15.1
Mariout	C. I. 261	14.9

The season favored the earliest varieties in every case. It is perhaps significant that Acme was the only wheat entirely free from rust.

There was a number of visitors to the station during August as follows: Aug. 2: J. H. Parker and Dr. I. E. Melhus. Aug. 3: Dr. H. B. Humphrey, C. S. Reddy, and W. E. Brentzel. Aug. 5: Dr. H. S. Conrad. Aug. 7: O. R. Matthews. Aug. 13: T. E. Stoa. Aug. 18: T. R. Stanton and S. T. Lockwood.

Mr. and Mrs. C. M. Woodworth are leaving on Sept. 3 for Fargo, N. D., on their way to Madison, Wis.

Dickinson Substation (Ralph W. Smith). The summer of 1919 at this station has kept its record for dry weather unbroken to the last. The precipitation for the three summer months was as follows: June, 0.52 inches; July, 0.53 inches; August, 0.59 inches. The normal precipitation for these months for the past 27 years is as follows: June, 3.07 inches; July, 2.19 inches; August, 1.99 inches. During the months of April to August, inclusive, the precipitation in 1919 was 5.49 inches, as compared with a normal of 10.99 inches. The weather during the past month has been considerably cooler than in June and July, the lowest temperature for the present month being 36 degrees on Aug. 30.

The threshing of plats and nursery was completed August 26, with the exception of flax. Yields are not available but the work of weighing and cleaning the grain is now in progress.

The corn crop is the most promising of any crop this year where the stand was not destroyed by cutworms. Seed corn is being gathered preparatory to filling the silo. The early varieties of flint corn were harvested August 29, being fully ripe, and the early varieties of dent corn will be harvested in a few days. High-ear selections of N. W. Dent show considerable improvement over the common low-ear type of that variety. The acreage of corn in this district will doubtless be considerably increased next year as it is being recognized as a fairly certain source of feed in these extremely dry years.

At the horse sale held in Dickinson during the past week, about 250 horses were sold, the average price receiving being about $55.00. The highest price was $207.00 for a team.

The soil and subsoil are in an extremely dry condition and considerable rain will be needed to germinate fall-sown grain.

MONTANA

Judith Basin Substation, Moccasin (P. V. Cardon, Supt.) No report.

(Extract from letter from C. W. Warburton, dated 9/6/19):

Crop Conditions in Montana and North Dakota. "A little plowing is being done in northwestern North Dakota, but all of Montana east of the divide is too dry to

plow. No rain of any consequence has fallen recently, and farmers are handicapped in doing fall work not only for this reason but also because of the scarcity of feed for horses. Bonds for drouth relief were authorized in several counties at an election last Tuesday, but no action has been taken as yet in a number of others. The rye acreage in North Dakota on stubble will be greatly reduced, and unless rain falls soon I doubt if much wheat is sown in Montana."

WESTERN BASIN AND COAST AREAS
(South to North and West)

UTAH

Nephi Substation, Nephi (Aaron F. Bracken). August brought three small showers with a total rainfall of .75 inches. The maximum temperature of 100 degrees occurred on the 24th, and the lowest temperature, 45 degrees, on August 14. Following June and July, August has been a very hot month.

Thrashing in this section is now almost finished. Due to the unfavorable season farmers underestimated their yields from one to five bushels per acre.

On the station thrashing was finished August 22. Since this date all grains for sowing on the station have been cleaned and the fall soil sampleing is half finished. After harvest Russian thistle came up very thick on a number of plots. These weeds were disked, raked in piles, and burned.

The following winter wheats were grown on twentieth-acre plots replicated three times, with yields as shown.

Odessa C. I. 3274	16.8 bu.	Beloglina C. I. 1544	15.2 bu.
Ghirka Winter C. I. 1438	16.7 "	Kharkov C. I. 1442	14.4 "
Alberta Red C. I. 2979	16.5 "	Crimean C. I. 1437	14.1 "
Bulgarian C. I. 2048	15.6 "	Kofoid C. I. 2997	13.4 "
Armavir C. I. 1355	15.3 "	Turkey C. I. 2998	11.7 "
Wash. Hybrid No. 128 C. I. 4326	15.2 "	Gold Coin C. I. 2996	11.4 "

The following common and durum spring wheats were grown on twentieth acre plots duplicated:

Saumur C. I. 2346	6.8 bu.	Kubanka C. I. 1440	5.0 bu.
Chul C. I. 2227	6.8 "	Peliss C. I. 1584	5.0 "
Farly Baart C. I. 1697	3.6 "	Bachir C. I. 2087	3.7 "
Koola C. I. 2203	3.1 "	Adjini C. I. 1594	3.6 "
Marquis C. I. 4158	2.8 "	Arnautka C. I. 1494	1.7 "
Defiance C. I. 5542	2.1 "	Velvet Don C. I. 2247	2.3 "
Ghirka C. I. 1517	2.0 "		
Pacific Bluestem C. I. 4067	1.6 "		
Dicklow C. I. 3663	1.5 "		
Galgalos C. I. 2398	1.5 "		
Regenerated C. I. 5543	1.3 "		
Little Club C. I. 4066	1.3 "		

IDAHO

Aberdeen Substation, Aberdeen (L. C. Aicher). After many months of the most severe drought ever experienced in this section, Jupiter has at last made a real serious attempt to give us a little relief. It rained a little at Aberdeen this morning (Sept. 1). The weather continues threatening and we may receive enough rain to make fall plowing possible.

Irrigation water has been out of the laterals for many weeks and the late crops are suffering greatly as a result. Beets and potatoes will make about a half crop. The sugar factory contemplates digging beets from two to three weeks earlier this year than usual owing to the condition of the beets brought on by the drought.

Threshing in the vicinity is being done at a rapid rate and yields of all cereals show decidedly the effect of lack of irrigation water. Most of the grain is shrunken and does not weigh up to standard. Yields are averaging between 20 and 25 bushels for wheat on the irrigated lands. Barley and oats are yielding between 45 and 50 bushels per acre.

All threshing on the Station, with the exception of the sugar beet seed and the cereal nursery, has been completed. Work on the latter will begin September 2.

Station yields are far below normal. This year, for the first time, Dicklow wheat has been outyielded by one other variety (Early Baart) and the average of duplicate plots gives the Dicklow sixth place in point of yield. This by no means, however, indicates that this high yielding variety should be looked upon with suspicion. Dicklow always makes its big yield from late watering and this year it failed entirely to receive a late irrigation.

Trebi barley has likewise been outyielded by other varieties, 6 others having outyielded this variety. Oats seem to have fared better in the matter of the high-yielding sorts maintaining their lead. Golden Rain this year averaged 56.2 bushels per acre.

Field and garden peas are yielding an approximate average of 20 bushels per acre. The average yield for several years is more than double this year's returns.

Mr. Briggs is still here, working hard to keep ahead of the rapidly ripening oats and barleys in the smut nursery. He expects to complete his labors by Sept. 4.

Seven varieties of corn sent to the Station by Mr. Hartley of Corn Investigations were recently harvested for the silage yield. Yields up to 14 tons per acre were obtained. One row of each sort is being preserved for maturity data. This year's results indicate very clearly that irrigated corn has not been planted early enough in the spring. April planting is entirely feasible at this altitude. While this year's early planted corn was frozen back very severely, it did not seem to injure the crop so far as yield or quality was concerned.

An excellent crop of Great Northern beans, seed for which were received from Mr. Oakley of the Seed Distribution Office, is just being harvested. Yields will be reported later.

The yield of sugar beet seed on the Station will not be up to the yield received two years ago, but it is estimated that a yield of 1400 pounds per acre will be harvested this year.

OREGON

Harney Branch Station, Burns (Obil Shattuck). The weather continues hot and dry with all crops ripening rapidly.

The Early Baart, Spring rye No. 26101, and the Sixty Day oat increase fields have been harvested. The tillage series, rates and first two dates of spring rye have also been harvested. The rates and dates of spring wheat failed, due to the drought, frost, and sage rats. The remains of the above, together with the winter wheat and rye varieties, have been harvested also.

The straw was so short that it was necessary to construct a sheet metal hopper 5 feet wide, 5½ feet long and about 12 inches deep to attach to the cutter bar of the mowing machine. This outfit did very effective work, prevented all loss of grain, and left the crop free from clods and trash.

On the irrigation tract the spring barley, wheat, and oat varieties are ready to harvest. The spring rye and winter wheat varieties are fully ripe.

The peas, beets, and alfalfa in the duty-of-water trials are receiving their final irrigation.

The grain harvest in the vicinity of the station will be very light this season, due to unfavorable weather conditions and numerous pests.

Sherman County Branch Station, Moro (D. E. Stephens). Dry weather prevailed during the month of August until the 30th, when a shower brought .17 of an inch of rain. Practically all threshing in the county has been completed. Turkey wheat in the northern half of the county yielded from 30 to 40 bushels per acre. In the southern half of the county, where there are shallow soils and where there was some frost injury, wheat yields ran from 15 to 20 bushels. The spring wheat was not good as winter wheat, but more than 90 per cent of the acreage of Sherman County was in winter wheat this year.

Threshing began on the Station on August 5 and was completed on August 29. The following tables give the yields of the grain varieties in the varietal experiments for the year 1919. These yields are considered remarkable for a season as dry as the present one. The total precipitation from September 1, 1918, to July 31, 1919, was only 9.42 inches. The rainfall for the growing season (April, May, June) of 1919 was only 1.25 inches. There was no rainfall of benefit to crops after April 10. The average yield of all the winter wheat varieties this year is greater than for any other year since the establishment of the station, except the year 1916.

The quality of the winter wheat is all number one. The bushel weights of the spring wheat varieties ranged from 54 to 59 pounds.

Winter Wheats

Variety	C. I. No.	Yield, bu. per acre
1. Turkey	2998	42.1
2. Turkey	1571	41.5
3. Wash. Hybrid 123	4511	40.7
4. Wash. Hybrid 128	4512	40.6
5. Kharkov	1442-12	40.0
6. Alberta Red	2979	39.0
7. Turkey	1756	38.4
8. Kanred	5146	38.4
9. Kharkov	5549	38.2
10. Turkey	1558	38.1
11. Theiss	1561	38.1
12. Beloglina	2239	37.8
13. Argentine	1369	37.5

14. Local Turkey	4429	36.6
15. Crimean	1437	36.3
16. Fortyfold	4156	27.7
17. Burbank Supervheat	5544	25.6
18. Triplet	5408	24.3
19. Jones Winter Fife	4468	22.2
20. Nebraska Hybrid No.28	5147	20.7
21. Fortyfold x Little Club(27-s-c)		30.5*
22. Fortyfold x Little Club(173)		21.3

*In duplicate twentieth-acre plats; all other varieties in triplicate twentieth-acre plats.

Spring Wheats

Variety	C. I. No.	Yield, bu. per acre.
1. Hard Federation	4733	28.5
2. Federation 4734	4734	28.5
3. White Federation	4981	28.3
4. Hard Federation	4980	26.3
5. Bobs	2826-1	26.3
6. Koola	2203-2	26.0
7. Talimka	2495-1	25.0
8. Early Baart	1697	24.2
9. Bluestem	4067	23.7
10. Sonora	3036-2	23.7
11. Karun	2200-1	23.3
12. Little Club	4066	23.0
13. Marquis	4158	22.7
14. Yentagbay	2404-1	22.1
15. Ble-Noir	2511-2	20.0
16. Galgalos	2398	19.0
16. Galgalos	2398	19.0
17. Kubanka	1440	15.5

Spring Barley
(Duplicated twentieth-acre plots)

Variety	C. I. No.	Yield, bu. per acre.
1. Meloy Beardless	1176	52.5
2. Peru	702-1	49.3
3. Trebi	936	47.7
4. Flynn	1311	47.1
5. Odessa	927	46.7
6. Coast	691-1	45.6
7. Peruvian	935	44.8
8. Mariout	261	42.7
9. Himalaya	620-1	42.5
10. Beldi	190	40.6
11. Hannchen	531	40.2
12. Hanna	906	40.0
13. Sandrel	937	40.0
14. Oderbrucker	537	38.1
15. Svanhals	187	37.0
16. Smyrna	958	35.4
		43.1

Rank	Variety	C. I. No.	Yield, bu. per acre.
1.		357-1	61.6
2.	Richland	787	58.1
3.	Kherson	459	56.9
4.	Sixty Day	165-1	52.2
5.	Swedish Select	134-1	50.3
6.	Three Grain		50.3
7.	Victory	742	50.3
8.	Shadeland Climax	681-	48.8
9.	Danish Island	519	48.8
10.	Sixty Day	165	47.5
11.	Albion	729	47.5
12.	Great Northern	524-1	46.6
13.	Western Wonder (Local)		45.3
14.	Siberian	635	44.2

WASHINGTON

Washington Experiment Station, Pullman (Geo. L. Zundel). We have plenty of smut this year, and plenty of smut explosions. Over twenty explosions occurred one day between Dayton and Waitsburg, and in one case a combine exploded, which caused a gasoline tank on a machine to explode, scattering gasoline all over nine mules. The mules caught on fire, became frightened, ran away, tripped down, and the nine mules and all the combine burned up. Certainly a very bad disaster.

Forest fires are raging around this country so severely that even today one hardly can see from one building to another. In fact, up in my laboratory on the third floor of Science Hall, it became necessary a little while ago for me to turn on the lights at eleven o'clock in the morning to see what I was doing.

Adams Branch Station, Lind (M. A. McCall). No report.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones). The maximum temperature for August was 103 degrees on Aug. 19, and the minimum was 52 degrees on Aug. 3 and 9. From Aug. 12 to Aug. 31, we were favored with good rice weather. The lowest maximum temperature for this period was 91 degrees and the lowest minimum temperature was 52 degrees.

Work at the station the past month consisted almost entirely of water-grass pulling.

The earliest rices at the station are starting to turn down; the medium early varieties are practically fully headed; and the late varieties are just beginning to head. The fertilizer, cultural, and irrigation experiments with variety Wataribune (C.I. 1561) are just starting to head.

Some commercial fields sown to early varieties will probably be harvested during the last 10 days in September; however, there will probably not be a great deal of rice cut before Oct. 1.

The Bureau of Biological Survey has granted permits to rice growers to kill migratory ducks by shooting, any time from August 15 to Oct. 15, inclusive, and from sunset to half an hour before sunrise from Oct. 16 to Nov. 30, inclusive, when necessary to protect rice crops from damage.

Plant Introduction Station (V. H. Florell). No report.

P6917

OCT 1 - 1919
BUREAU OF INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture.
(NOT FOR PUBLICATION)

- -

Vol. 11. September 20, 1919. No. 17
Personnel (Sept. 11-20) and Field Station (Sept. 1-15) Issue.

- -

PERSONNEL ITEMS

Daniel A. Albrecht, who was appointed for barberry eradication in Illinois on July 1, has accepted a position in the Agricultural College at Amherst, Massachusetts, and will tender his resignation within a few days.

Dr. Ruth F. Allen, who has been engaged in identifying grass and grain rusts sent in by the field force, left Washington on September 12 for the California Experiment Station at Berkeley, which will be her permanent station in future. She will assist Professor Mackie in the investigation of rusts in California, giving special attention to laboratory and greenhouse studies of stem rust of wheat and leaf rust of barley with reference to rust resistance.

H. Howard Biggar, who is assisting in the corn disease experiment at Bloomington, Illinois, will take leave in South Dakota during the latter half of September and will resume his official duties with a visit to the Kansas and Iowa Experiment Stations to assist temporarily with the corn rot experiments at those stations.

G. R. Bisby, Assistant Pathologist of the Minnesota College of Agriculture and Experiment Station, and a collaborator of the Bureau, was given authorization on August 1 to assist in the investigation of black rust in the States of the Upper Mississippi Valley. He spent the last eleven days of August in South Dakota, principally in the Black Hills, collecting rusts.

Sarkis Boshnakian, who has been engaged on black rust investigations during the summer, and more recently has been assisting in the tabulation of data on the corn-rot experiments at Bloomington, Ill., arrived in Washington on September 13 to complete his report of work concluded before returning to Cornell University to complete his post-graduate study.

George J. Burt is now in Alabama attending to the harvesting of his experimental corn plats, the selecting and gathering of seed corn, and the recording of experimental data. Upon completion of this work he will proceed to points in Illinois, Indiana, Michigan, and Wisconsin for the same purpose.

Guy N. Collins, botanist and corn breeder in the Office of Crop Acclimatization, was authorized to accompany Dr. Leighty and Mr. Kyle to Massachusetts and New York to study the corn borer situation on Sept. 14 to 17, inclusive. He was accompanied by J. H. Kempton of the same office.

Bret E. Cooley, who was assigned to barberry work in Minnesota on July 1, left the work September 10 to return to his former position as instructor in a High School in St. Paul.

James H. Defandorf, who was appointed field assistant on August 1, 1919, and has since been assisting in barberry eradication in Ohio, returned to Washington on September 20 and tendered his resignation. He is planning to take up more permanent employment.

L. W. Durrell, assistant in the investigation of oat crown rust in Iowa, spent the period from September 2 to 5 in Southeast Iowa.

Dr. Arthur T. Evans, who has been engaged at Bloomington in cytological studies of corn plants infected with Fusarium rots, resigned effective September 19 to accept the Professorship of Botany in Huron College, Huron, South Dakota, at a marked increase in salary.

John R. Fitzsimmons, who received his appointment on April 7 to assist with barberry eradication in Colorado, resigned September 4 to resume his studies at the agricultural college at Fort Collins, Colorado.

Dr. F. D. Fromme, Pathologist of the Virginia Experiment Station, arrived in Washington September 13 to discuss with Dr. Johnson and Dr. Humphrey the necessary procedure for the further investigation and control of the outbreak of take-all recently discovered near Roanoke, Virginia. He returned to Roanoke with Dr. Johnson that night.

David H. Fullerton was appointed Field Assistant effective September 11, 1919, to assist with the investigations of the nematode disease of wheat. Mr. Fullerton studied three years at Cornell University, receiving his B.S. degree in 1910. He was County Agent in Grant County, Kentucky, during 1914, 1915, and 1916.

Harry S. Garrison, who has been ill for the past two weeks, is reported on the road to recovery and expects to return to his duties soon. He is at New Alexandria, Pa.

Gilbert D. George, cartoonist and illustrator in the barberry eradication campaign, who has been spending a month in Washington completing cartoons and assisting in mapping the publicity program for the coming winter, left Washington September 12 to return to his official headquarters at University Farm, St. Paul, Minnesota.

Dr. Joseph C. Gilman was appointed Collaborator effective August 29, to assist with the cooperative experiments on the Fusarium rots of corn conducted by the Office of Cereal Investigations at Ames, Iowa. Dr. Gilman received his B.S. degree from the University of Wisconsin in 1912, and his Doctor's degree from Washington University at St. Louis in 1915. From June 1, 1918 to August 31, 1918, Dr. Gilman was under appointment as Field Assistant in Plant Disease Survey.

George H. Gillespie, recently engaged in the barberry campaign in Michigan, arrived in Washington September 16 for conference and transfer to the investigation of the nematode disease of wheat. He left for Roanoke, Virginia, with Dr. Humphrey and Dr. Johnson on September 13, and will work in Virginia and West Virginia.

Dr. George N. Hoffer, Pathologist in Charge of the investigations of Fusarium rots of corn at the Indiana Experiment Station, was in Washington on September 15 and 16 for conference concerning results obtained to date and plans for future work. He left on September 16 to visit the experiments under his supervision at Milford, Connecticut, and other eastern points.

Mrs. Agnes C. Hoffman, Typist, has been transferred to this Office from the Office of Records and reported for duty on September 18. She is assigned to the fiscal section and will assist Miss Flynn in the writing of letters of authorization and amendments thereto.

Merle T. Jenkins, who for the past three weeks has been selecting and drying seed corn in the States of Iowa, South Dakota, and North Dakota, will soon visit Piketon, Ohio, for the purpose of harvesting the experimental corn plats and selecting seed corn at that point.

Dr. A. G. Johnson returned to Washington from Madison, Wisconsin, September 12, to make plans for the investigation and control of the outbreak of take-all near Roanoke, Virginia. He went to Roanoke on September 13, accompanied by Dr. Fromme and Messrs. Fullerton and Gillespie. After surveying the situation there, he returned to Washington.

P. Denton Joseph, who has been on barberry eradication in the State of Iowa since last July, resigned September 12 to return to the agricultural college at Ames, Iowa, for graduate study, having accepted a fellowship there.

Curtis H. Kyle, Physiologist in Corn Investigations, returned on September 12 from his investigation in Florida and South Carolina, and left on September 14 for Massachusetts and New York with Dr. Leighty and Mr. Collins to study the corn borer situation with reference to agronomic control measures. He returned on September 17.

Miss Elizabeth C. Lambert, a former stenographer in this Office, was transferred to this Office from the States Relation Service on September 16 to assist in the fiscal division. Miss Lambert is taking a course in accountancy and expects to follow this line of work in the future.

Dr. C. E. Leighty, Agronomist in Charge of Eastern Wheat Investigations, left Washington on September 14 to visit the areas in Massachusetts and New York which are infested by the European corn borer. He was accompanied by Mr. C. H. Kyle of the Corn Investigations Project, and Mr. G. N. Collins, Corn Breeder in the Office of Crop Acclimatization. They made a brief survey of the situation with a view to possible control measures through rotation and breeding experiments. He returned to Washington on September 17 and was on leave September 19 and 20.

Peter A. McMillen left the barberry campaign in Minnesota on September 10.

A. W. Marker left the barberry campaign in Nebraska recently to return to his former position as instructor in a High School at St. Joseph, Missouri.

Allen G. Newhall, who was appointed August 16 for some special work in barberry eradication in Minnesota and Nebraska, resigned September 15 to resume his duties at the University of Minnesota.

Fred D. Richey returned to Washington on Sept. 11 after a short visit to points in New York and New England, for the purpose of obtaining information as to the behavior of corn under different environments, methods of breeding corn, and methods of cultivating corn. He left Washington on September 15 for several points in the States of Illinois, Missouri, Arkansas, and Louisiana, for the purpose of selecting seed corn, harvesting experimental plats, arranging for next year's work, and such other work as may be necessary in connection with the improvement of corn and methods of corn production. He plans to visit the Tri-State Fair at Memphis, Tennessee, for the purpose of securing information as to local varieties of corn, corn problems and to meet corn growers of of that section.

Walter J. Roth, who has been connected with the barberry campaign in the State of Colorado since February 15, left the work there on September 16 to take up graduate work at the University of Illinois. His address will be 1210 West Springfield Avenue, Urbana, Illinois.

Glenn M. Smith, who was assisting Dr. Hoffer in corn rot experiments at Lafayette, Indiana, spent most of August in inspecting and getting data on the field experiments in Indiana, Iowa, Michigan, and Ohio.

Charles W. Van Cleve, who has been assisting with the barberry campaign in Minnesota since August 1, left the work September 10 to return to his former position of city superintendent of schools at Le Seuer, Minnesota.

A. C. Vogele, who was appointed July 2 to assist in barberry work in the State of Illinois, resigned September 16 to return to the University of Illinois to continue graduate work and assist in the department of botany.

John C. West, who has assisted in barberry eradication in Minnesota since July 1, left the work on September 10 to accept a permanent position elsewhere.

Dr. William H. Weston, Jr., who is in charge of the investigation of downey mildews and who for two years has been making a personal investigation of the downey mildew of maize in the Philippine Islands, spent several weeks the past summer in the southern part of the Philippine Archipelago where he obtained much additional information and made one very important discovery in connection with the life history of this disease.

Thomas M. Whiteman, who was appointed field assistant on August 1, 1919, and was assigned to the barberry eradication campaign in Ohio, resigned September 14 to resume his studies at Delaware State College.

Miss Florence S. Willey, who is assisting Dr. Melhus in the investigation of crown rust of oats at the Iowa Experiment Station, is spending the period from September 17 to September 27 on vacation in Chicago.

Cecil H. Wilkinson, who was appointed for barberry eradication in Illinois, effective July 18, resigned September 25 to return to the Agricultural College of Illinois to resume his studies.

Fred T. Woolverton, who was appointed July 1 to assist in the barberry eradication campaign in Minnesota, left the work there September 10 to return to his former position as city superintendent of schools at Akely, Minnesota.

VISITORS

Felix J. Schneiderhan, whose farming operations in Delaware were noted in a recent issue of the Courier, was an office visitor on September 18. He had come to Washington to witness the parade of the First Division.

Señor Ismael Tocornal, Chilean Ambassador to Great Britain, was an interesting office visitor on September 15 in the interest of obtaining cereal varieties adapted to Chilean conditions.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). Extract from letter of Director Dodson on Sept. 18. "I have just returned from Crowley, having spent a part of yesterday and the day before there. I find everything in excellent condition, considering the bad season and both of the men seem to be getting along splendidly.

"I am sure that you will be interested in knowing that some of the varieties developed at the Station, grown by some of the farmers in field tests, are turning out splendidly. One party has sixty acres of the Acadia rice which he thinks will average thirty bags to the acre, two hundred pounds to the bag, which is a very extraordinary yield. This is on river land, where fifteen bags is considered a good crop.

"While I was at Crowley yesterday we made temporary plans for some demonstrations of the cooking qualities of some of these new rices, sometime this fall."

GEORGIA

State Experiment Station (Athens) and Substations (R. R. Childs). No report.

TENNESSEE

State Experiment Station, Knoxville, and Substation, Jackson (C. A. Mooers) No report.

NORTH CAROLINA

State Experiment Station, West Raleigh and Substations (G. M. Garren). No report.

VIRGINIA

Arlington Farm, Roslyn (T. R. Stanton). In general, fair weather prevailed during August. The maximum temperature for the month was 93 degrees (Aug. 24); minimum, 51 degrees (Aug. 27); total precipitation, 3.71 inches. Weather during the first 15 days of September has been warm and sultry with a precipitation of 0.91 of an inch. A maximum temperature of 96 degrees was registered on Sept. 8. The lowest minimum temperature was 48 degrees on the 14th.

Thrashing of all grain from field plats and nursery rows was completed on August 16. All the lots of wheat, oats, barley and rye from increase and varietal plats have been fanned. The weighing of grain from the various cereal nurseries is now in progress. Seed for fall sowing also is being prepared. Practically all seed of winter oats for both nursery and field plats has been treated with formaldehyde for smut.

Winter oats were unusually good on the farm during the past season. The following are the average yields in bushels per acre of the 15 varieties and selections which were grown in triplicated fortieth-acre plats.

Variety	C. I. No.	Yield in bu.
Winter Turf Selection	541-4	82.9
" " "	409-5	81.9
" " "	435-4	76.5
Culberson selection	273-1-14	73.8
Bicknell selection	206-155	72.5
Culberson (12 checks)	273	71.6
Fulghum	708	70.6
Winter Turf selection	274-20	70.0
Winter Turf	431	68.3
Bicknell selection	206-151	66.3
Culberson selection	273-1-10	66.2
Aurora	831	66.0
Dwarf Culberson	748	64.6
Winter Turf selection	195-10	56.0
Red Rustproof selection	518-3	55.2

Excellent yields also were obtained from the varieties and strains which were grown in triplicated 15-foot nursery rows.

Average yields of barley varieties grown in fortieth-acre plats, replicated twice, are given below.

Variety	C. I. No.	Yield in bu.
Orel	351	48.8
Nekano Wase	754	46.2
Nekano Wase Selection	754-1	40.0
Wisconsin Winter Selection	519-VIII	39.8
" " "	519-26	38.6
Nekano Wase Selection	754-3	36.7
Scottish Pearl	277	31.5
Pidor	901	30.7
Tennessee Winter (average of 13 checks and variety plots)		30.1
Square-head Winter	252	29.8
Tenkau	646	29.4
Greece	221	29.0
Cusado	895	25.8
Hansee Hullless	703	25.0
Swanhals	187	25.0
Texas Winter	554	24.8
Switzerland	S.P.I. 38057	24.4
Khayyam	1117	24.2
Omar	898	24.2
Han River	206-1	22.9

NEW YORK

Cornell Experiment Station, Ithaca (H. H. Love). The first half of September has been very dry which has interfered with the proper preparation of soil for fall seeding. Nevertheless, considerable wheat seeding has already been done in the State, and the farmers now are busy with this work. During the last few days heavy showers have fallen, which have helped the situation considerably. In spite of the warning regarding the Hessian fly much early seeding has been done on farms. No seeding has been done yet in connection with investigations conducted here at Ithaca but will seed around the 20th. The hybrid series will be seeded probably the last week in September.

MISSOURI

State Experiment Station, Columbia (L. J. Stadler). No report.

IOWA

State Experiment Station, Ames (L. C. Burnett). Continued dry weather is ripening the corn very rapidly. It will be very difficult to fit winter wheat ground until it rains.

GREAT PLAINS AREA (South to North)

TEXAS

Amarillo Cereal Field Station, Amarillo (John F. Ross). No report.

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). The precipitation for the first half of September has been nil; the weather also has been warm and row crops have been ripening rapidly. Harvesting of the sorghums has been carried on as they ripened and it looks as if most of the harvesting would be done before frost. The weather data for this month are: precipitation, none; maximum temperature, 99 degrees on Sept. 10; minimum temperature, 50 degrees on Sept. 14. This county will need a good rain before wheat can be sown.

The sunrise kafir of the rate-of-seeding experiment was harvested on Sept. 9, and the six thicker plats of the rate-of-seeding experiment of milo were harvested this morning, Sept. 15. The kaoliangs, Manchu, C. I. No. 171, and Valley Brown, C. I. No. 309, of the varietal experiment were harvested on Sept. 3, while feterita, C. I. No. 182, and Spur Feterita were harvested on Sept. 4. On September 13 the four plats of milo, red and black amber and Barchet kaoliang were harvested. All the broomcorn with the exception of the nursery and the last date-of-seeding plat are harvested.

Mr. Rothgeb visited the Station on September 8, took several pictures, and also went over some of the hybrid work.

KANSAS

Fort Hays Branch Station, Hays (A. F. Swanson). The weather still continues dry, no moisture having fallen since August 10.

Threshing is well under way throughout this vicinity. A few farmers have begun seeding wheat.

A number of good sorghum fields have been noted. Pink Kafir, Freed Sorgo and Feterita seem to be the popular grain varieties.

With the exception of Shallu, a few varieties of Pink kafir and Dwarf Blackhull kafirs, all sorghums are now harvested on the Cereal Project. Much seed

has been selected for head-row and varietal experiments next year.

Rate and date of seeding wheat was begun September 8 and will continue for ten weeks.

Sorghum Day was observed on Saturday, September 6. The program was held in the fields where the results of each experiment and the value of each variety were explained. There were exhibited 58 varieties of sorghums and 350 acres of the leading varieties in commercial fields. The station has sorghums this year as follows:

1194 single rows each planted from a selected head.
232 larger plots showing 58 varieties and 97 cultural methods.
120 acres of Red Amber, 100 acres of Pink Kafir, 60 acres of Feterita, 45 acres Sudan Grass, and 25 acres of other varieties.

The meeting was well attended and much interest shown. Head samples were furnished those who desired. This week the station will exhibit sorghums at the local county fair.

Professor John H. Parker of the college and Mr. B. E. Rothgeb of the Department visited the station recently in the interest of sorghum breeding.

State Experiment Station, Manhattan (John H. Parker). The weather during the last half of August remained dry with moderate to high temperature. The mean temperature for the month was 78 degrees, maximum 108 on the 6th, and minimum 47 on the 31st. The total rainfall for the month was 1.65 inches. The corn crop was severely injured, but sorghums in most sections were making good growth.

Weather during the first half of September has continued warm and dry. Maximum temperature, 103 degrees on the 10th; minimum, 50 degrees on the 1st and 5th; no precipitation. This condition means that very little plowing or disking for wheat has been done and that wheat seeding will probably be delayed and some of it done with very poor seed bed preparation. It will not be possible, in fact, to plant wheat in this locality until there is rain.

Professor Salmon expects to make sowings at Wellington and McPherson, Kansas, of rather extensive series of wheat varieties to be tested for amount of infection of Hessian Fly. Professors Salmon and Cunningham of the Agronomy Department are spending this week at the four western Kansas substations in the interest of sorghum work.

Professor L. E. Call returned to his regular place as head of the Agronomy Dept. on Sept. 1 after a six months' leave of absence spent in agronomic work in France. Mr. J. H. Martin spent the week of August 25 to Sept. 1 here, and was engaged in making plans and sending out seed for winter hardiness wheat nurseries. Mr. B. E. Rothgeb spent September 5 at Manhattan in looking over the grain sorghum work. Mr. Parker also returned to Manhattan on September 8, after a two weeks' trip with Mr. Rothgeb in the interest of grain sorghum work with particular reference to sorghum breeding and selection.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). Weather conditions in this section of Colorado have changed for the better. Since September 1 a total of over two inches of precipitation has been received. During the past two weeks

local showers have been received throughout northeastern Colorado. In some localities very heavy rains have fallen, resulting in considerable damage.

Soil conditions are at present ideal for seeding operations. Sowing of fall wheat is occupying the attention of the farmers. Possibly a slightly larger percent of the fall wheat acreage is being plowed this season than has been customary heretofore.

Practically all of the corn and sorghum crops have been cut. All feed crops are light this year, due to the extended dry weather. The late rains are greatly improving the range grass which will help alleviate any feed shortage that might otherwise occur.

Thrashing of the nursery project was completed during the first part of September. From some of the nursery plats very good yields were secured. One plat of Blackhull barley (C. I. No. 878) produced a yield of nearly 35 bushels per acre, and a plat of oats of the Kherson type gave an average of nearly 33 bushels to the acre.

The first two seedings in the combination experiment have emerged to excellent stands. The September first seeding was delayed until September 4 on account of rains on the first three days of the month. The third seeding in this experiment was made September 16. This grain has sprouted to some extent.

The varietal experiments in plats were seeded on September 16. Four plats each of fourteen varieties are included in this experiment. This wheat has already started to germinate.

The Washington County fair is to be held September 24 to 26. A new 220-foot stock pavilion is being erected to accommodate the live stock exhibit. Some very good attractions are promised and it is probable that a large percentage of the people of the county will attend the fair. Work on a display of the 1919 crops of the Akron Station is occupying the attention of part of the station force at the present time.

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson). The month, so far, has been very favorable for the seeding of winter wheat, the precipitation being 2.43 inches. These conditions have delayed the three or four days' thrashing still in the field but have greatly aided winter wheat which has been seeded and have put silage crops into better condition for putting into the silo. Silo filling is in progress, there remaining one more day's work at this job. All Dry-Land plats have been plowed and other tillage completed for the season.

During the past two weeks a new windmill has been placed on the old tower and the water system at the dairy barn improved. We also have a new dairyman, Mr. Rosenthal, who is a graduate of the Agricultural College of Colorado.

Sheridan Field Station, Sheridan (Leroy D. Willey). No report.

SOUTH DAKOTA

Bellefourche Experiment Farm, Newell (A. D. Ellison). Thrashing of small grains grown in plats and in nursery rows has been finished. Seeding of winter wheat under both dry and irrigated conditions is being done this week. On account of an insufficient amount of rainfall, the soil is not in the best of tilth for seeding purposes. Proso millets have been cut and thrashed. Fairly

good yields were obtained from the proso varieties, although the birds did considerable damage by eating the seed before the crop was harvested.

Maximum temperature for the first half of September was 94 degrees on the 12th; minimum, 43 degrees on the 14th; precipitation, 0.70 of an inch.

The third cutting of alfalfa throughout the Project is being put in the stack. The corn crop is not as good as in previous years, although a good quality of seed is being produced. Small grain thrashing in general is well advanced, the crop this season being below normal.

Cottonwood Substation, Cottonwood (Manley Champlin). No report.

Vivian Substation, Vivian (Manley Champlin). No report.

Eureka Substation, Eureka (Manley Champlin). No report.

Highmore Substation, Highmore (E. S. McFadden). I am sending herewith yields of the cereal varieties grown on the Highmore substation in 1919. The yields are computed from single fiftieth-acre plats, all duplicate sowings having been destroyed by high water.

Winter Wheat

Variety	S. D. No.	C. I. No.	Yield in bu.
Kanred	1098	3146	27.80
Kharkov	59	4207	24.37
Turkey	144	3689	23.52
Theis	352	1561	23.12
Turkey	58	1558	22.91
Crimean	353	2943	21.87
Kharkov	191	1442	21.66
Kharkov	76	1583	21.66
Turkey	635	3055	21.04
Nebraska No. 6	1137	6249	21.66
Nebraska No. 60	1138	6250	20.83
Neb. Hybrid No. 28	1097	5147	19.50
Buffum	1171	3330	6.66
Red Rock	1176	5976	20.20

Winter Rye

Rosen	1175		33.03
Advance	1030	181	31.02
Dean	177	136	30.35
N. D. No. 959	590	175	28.12
Swedish	348	137	27.45
Swedish	348-15		26.78
Hansen	578	182	26.33
Wisconsin No. 1	1179		26.11
X	1172	178	24.55

Spring Wheat

Durum

Acme		5284	17.49

D. #5	3322	16.38
Monad	3320	15.82
Kubanka	1440	15.54
Algeria	3310	12.50
Golden Ball	6227	11.38
Buford	5295	11.10
Black Don	6252	10.54
Mindum	5296	8.60
Sloat	6046	7.49
Pierson	4163	3.88
Arnautka	4064	2.49
Common		
Prelude	4323	14.79
Wisconsin Wonder	5525	14.79
Marquis	3641	10.26
Pioneer	4324	10.26
Preston	3081	7.77
Power Fife	3697	2.21
Haynes Bluestem	2874	1.10

Oats

Early		
Cole (Selection from C. I. 165)	834	50.38
Albion	729	43.35
Sixty Day	165-29-12	42.96
Sixty Day	165	42.18
Sixty Day	165-566	39.84
Richland	787	38.67
Sixty Day	625	35.54
Sixty Day	165-16-12	35.54
Nebraska No. 21	841	35.15
Midseason		
Silvermine	659	22.65*
Golden Rain	493	16.01*
Swedish Select	134	14.84*
Victory	560	12.50*
Late		
Eclipse	843	3.12*

Barley

Odessa	182	40.62
White Smyrna	195-7-'15	39.57
White Smyrna	195-14-'15	35.06
White Smyrna	195-19-'15	34.02
White Smyrna	195-27-'15	32.62
Coast	690	31.25
Gatami	575	28.90
Oderbrucker (S. D. 1180)		28.90
White Smyrna	195	26.73
White Gatami		26.04

* Severely injured by grasshoppers.

Hannchen	531	25.78
Manchuria	576	23.69
Horsford	507	22.91
Wing's Pedigreed Horsford		22.39
Poppenheim (Hullless)	314	21.35
Gold	1145	15.88

Flax

Select Russian (N. D. 1215)	3	2.90
Select Russian	3-2-'12	3.57
N. D. 155	17	2.23
Russian	19	2.67
N. D. R. 114	13	1.78
N. D. R. 52	8	2.00
Primost	12	1.33
Common	29	1.56
Smyrna	30	.66
Russian	1	.89
Acro	163	2.00

State Experiment Station, Brookings (Manley Champlin). No report.

NORTH DAKOTA

State Experiment Station, Agricultural College (Theodore E. Stoa). Have had no frost up to this date (Sept. 16) and corn is maturing in good shape. It will be a big crop.

Threshing is about completed in the Red River Valley. Wheat yields in this section run, in general, from 8 to 12 bushels. Farther west these drop to 5 to 8 bushels, with some favored localities reporting better yields. West of the Missouri River the crop has again been almost a failure. Flax that is threshed is yielding from good in the Valley to fair in the center, and almost nothing beyond the Missouri River. In these dry districts large flax acreages are not worth cutting. The State production of flax this year will be low. The early season will permit much plowing this fall. It is being encouraged to combat the grasshoppers. The impression comes, too, that considerably less winter rye will be seeded this fall.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). The first half of September has continued dry and mild with no frost to date.

All flax plats have been thrashed except some late sown bulk recently harvested and the June 15 date-of-seeding which has not yet been harvested. Seed has not been cleaned, however, and yields have not yet been computed.

A triplicated series of twenty-two winter wheat varieties was sown here Sept. 13, but probably will not have an opportunity to germinate until we have a good rain.

Mr. and Mrs. C. M. Woodworth left Sept. 3 for Fargo, N. D., on their return trip to Madison, Wis.

The Missouri Slope Fair is now in full swing on a larger scale than ever before with splendid exhibits of stock. Especially noteworthy are the pigs and poultry belonging to members of the pig and poultry clubs under the direction of county agents for Morton and adjacent counties.

Maximum temperature for the half month was 94 degrees, recorded Sept. 7; minimum, 37 degrees, recorded September 15; precipitation, 0.27.

Dickinson Substation (Ralph W. Smith). The dry weather has continued to date with only 0.22 of an inch of rainfall this month so far. No fall plowing is being done, due to the extremely dry condition of the soil. There has been no frost yet, the lowest temperature being 36 degrees on September 15.

It is expected to sow the winter wheat and rye this week. The seeding of this grain has been postponed partly because of the probability of injury from grasshoppers and partly in the hope that rain would fall and put the ground in better condition for seeding.

Corn at the Substation has been harvested and the silo partly filled with corn and sunflowers. A large quantity of good seed corn of the Northwestern Dent variety has been saved, the ears being larger and better matured than in ordinary years although the stalks and ears were low, requiring harvesting with the grain binder.

In a varietal experiment with three varieties of flint corn and seven varieties of dent corn, Gehu flint gave the highest yield, about 25 bushels per acre, and Northwestern Dent was the highest yielder among the dents with a yield of about 20 bushels.

There is practically no fall plowing or seeding being done by the farmers. Many of them are stacking Russian thistles for hay and some are making silage of them.

MONTANA

Judith Basin Substation, Moccasin (P. V. Cardon, Supt.). No report.

WESTERN BASIN AND COAST AREAS
(South to North and West)

UTAH

Nephi Substation, Nephi (Aaron F. Bracken). A welcome storm occurred on September 2 and 3, but the .95 of an inch of rain which fell was not sufficient to moisten the dry soil to a great enough depth to make seeding of fall grains safe. A few farmers seeded, however, and before the storm which is now starting were regretting that they took such a chance.

On the station during the last two weeks the fall sampling of plots for moisture was finished and all fallow plots except those in special cultural experiments have been harrowed as a final preparation for seeding. Considerable weeding also has been done. During the last two seasons the Russian thistle has rapidly seeded the whole farm. This year is hoped to be the last for this pest.

IDAHO

Aberdeen Substation, Aberdeen (L. C. Aicher). No report.

OREGON

Harney Branch Station, Burns (Obil Shattuck). No report.

Sherman Co. Branch Station, Moro (D. E. Stephens). No report.

WASHINGTON

Adams Branch Station, Lind (M. A. McCall). No report.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones). No report.

Plant Introduction Station (V. H. Florell). No report.

17

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

- -

Vol. 11. September 30, 1919. No. 18.
Personnel and Project Issue.

- -

PERSONNEL ITEMS

Donald Bain, who has been assisting with the barberry work in North Dakota, returned to the University of Tennessee on September 19 to continue his studies.

Clarence E. Baker, who received his appointment for barberry work on April 7, 1919, resigned on September 25 to resume his studies toward a degree at the University of Illinois.

Walter L. Blain, appointed on April 5, 1919, to aid in the barberry eradication campaign in Illinois, has been appointed Assistant in Botany at the University of Illinois, and will also pursue graduate study.

Harry A. Borthwick, who has been engaged in cereal disease survey and nematode disease investigation during the summer, resigned on September 17 to attend college at Stanford University, Palo Alto, California.

Donald Brazie, who was appointed July 1, 1919, to assist with the barberry campaign in Iowa, resigned on August 26, 1919.

Ernest B. Brown returned to Washington on September 26, after completing the work of harvesting his experimental corn plats in Texas, Louisiana and Mississippi.

William E. Bruner, who has been assisting with the barberry campaign in Nebraska, resigned on September 22 to resume his studies at the University of Nebraska.

Lester W. Bullard, who was appointed on March 25, 1919, to assist in barberry eradication in North Dakota, returned to the Agricultural College of North Dakota on September 24 to continue his studies.

R. A. Carroll has finished the nematode survey in Georgia and arrived in Washington on September 23 to continue this work in the northern part of the Shenandoah Valley in Virginia.

John H. Christ, who has been engaged in the collection of rusts in Idaho during the summer, completed his work for the season and resigned on September 12.

Ibra L. Connors, who has been engaged in rust epidemiology studies during the summer, resigned on September 30 to accept a position as Fellow in the Department of Botany at the University of Toronto, Ontario, Canada.

R. F. Crawford, who was appointed on August 4, 1919, for barberry eradication in June, resigned on September 1, 1919, to take up graduate study at the Iowa State College. He will also take charge of the experimental plots and greenhouses for the Department of Botany there.

Walter H. Cudaback, appointed on August 4, 1919, for barberry eradication in Michigan, resigned on September 29, 1919.

Ralph E. Curtiss, who was appointed on February 20, and assigned to barberry eradication in Illinois, resigned September 25 to enter the graduate school at the University of Minnesota.

Wilmer E. Davis, who has been collecting rusts and the wild grass hosts of rust species during the summer, resigned on August 31 to return to his duties as Instructor in the Kansas Agricultural College.

Dr. Charles Drechsler, who has been engaged on the cereal disease survey since July 1, has completed that work and is now assisting Dr. Johnson in the investigation of the Helminthosporium diseases of barley, with headquarters at Madison, Wisconsin.

Miss Mayme Dworak, who was appointed for barberry eradication in Nebraska on August 21, 1919, returned on September 6 to her former position as teacher of Botany in the high school at Lincoln, Nebraska.

Leo Joseph Federer, appointed August 5, 1919, to assist with barberry eradication in Wisconsin, resigned September 21, 1919, to continue studies at University of Wisconsin.

Frank Frolik, who has been under appointment since February, 1919, as Assistant Pathologist in epidemiology studies of black stem rust, resigned August 31, 1919, to accept the position of Extension Plant Pathologist at the Minnesota College of Agriculture.

Forrest V. Fuller, who was appointed on July 9, 1919 to assist Dr. Jackson and Prof. Mains in laboratory cultures of leaf rusts at the Indiana Experiment Station, resigned on September 23 to resume his studies in the College of Forestry, Syracuse University.

J. Howard Gage, who was appointed on July 1, to assist in the barberry campaign in Illinois, resigned on September 25, to return to the University of Illinois to continue his graduate studies.

John M. Gazett, who has been with the barberry campaign in North Dakota since April 25, 1919, resigned on September 27, 1919.

Archie L. Gibson, transferred from take-all control in Illinois to barberry eradication in Ohio early in August, resigned on September 9, 1919, to return to college.

James F. Groves, who has been under appointment as pathologist in the investigation of black stem rust since June 6 of this year, resigned on September 15 to resume his duties in the Department of Botany, at Ripon College, Ripon, Wisconsin.

Emil F. Guba, who was appointed for barberry eradication in Illinois on July 1, 1919, resigned September 30, to take up graduate study at the University of Illinois and also will assist Dr. H. W. Anderson in the Horticultural Department during the winter.

Milton C. Gugler, who was appointed on June 1, 1919, for barberry eradication in Wisconsin, resigned on September 26, 1919, to continue studies at University of Wisconsin.

J. M. Hamerly reports that at Round Hill, Va., his experimental plats produced the best corn he has obtained in that section for several years.

C. P. Hartley returned to Washington on September 24 after several days' visit to Rhinebeck, N. Y., where he inspected the experimental work of L. S. Mayer for the purpose of noting the results of corn breeding and field experiments.

Earl H. Heassler, appointed for barberry eradication in Wisconsin, resigned on September 24 to resume his studies at the University of Wisconsin.

W. C. L. Hines has been appointed Field Assistant in Plant Pathology, effective September 22, to assist in the investigation of Fusarium rots of corn at Bloomington, Illinois. He is a graduate of Grinnell College at Grinnell, Iowa, and a graduate in agronomy in the Iowa State College in 1917. He has since done post-graduate work in plant pathology at that institution. In the fall of 1917 he was engaged in the smut control campaign of this Office. He was discharged from the U. S. Army on September 14, and will report in Washington for conference and instructions.

Budd A. Holt has completed his work on the survey for wheat nematodes in West Virginia and resigned September 20 to resume his studies at the University of Minnesota.

Warren J. Hoyt, appointed on July 1, 1919, to assist in barberry eradication in Michigan, resigned on September 30, 1919.

Miss Annie M. Hurd, who has been assisting Professor Mackie in California in his investigation of black stem rust, has been transferred to Washington, where she will conduct an investigation of the physiology of germination seeds in connection with rust investigations. She arrived on September 29 and will be concerned especially, at present, with the seeds of wild grasses which have been collected in the study of wild hosts of rusts.

Charles J. Jackson was appointed on September 22 as Field Assistant for temporary service in connection with the handling of field plats in the corn rot investigations, at Bloomington, Illinois.

Curtis H. Kyle left Washington on September 29 for Brooksville, Florida, to complete his work of selecting, drying, packing and shipping seed corn, harvesting experimental field tests, taking field notes, and arranging for plantings in the spring of 1920.

Edwy Simon Landry has been appointed Agent, effective October 1, to assist Supt. J. Mitchell Jenkins with the rice experiments at the Crowley Rice Experiment Station. Mr. Landry, who received his B.S. degree from the University of Louisiana, was under appointment in this Office as Field Assistant from June 1 to July 31, 1918, when he resigned to enter the U. S. Army, and again from March 1 to August 31, this year.

Miss Acelia M. Leach, who has been assisting in the barberry eradication campaign in Michigan, resigned on August 31, 1919, to return to the Michigan Agricultural College to resume her studies.

Harold H. McKinney, in charge of the Take-All Control Investigation, made a flying trip to Washington on September 22 to discuss the proposed fertilizer, infection, and rotation experiments with take-all and flag smut on the two experimental areas in Madison County, Illinois.

Prof. George W. Martin, who has been engaged on field investigation of smuts during the summer, resigned on September 8 to return to his duties as Professor of Botany in Monmouth College, Monmouth, Illinois.

Miss Bertha J. Miller, of Madison, Wisconsin, has been appointed stenographer and typewriter, to assist Dr. A. J. Johnson, at Madison, Wisconsin. Miss Miller reported for duty on September 26 and will take the place left vacant by Mrs. Pansy D. McKinney, who has resigned effective September 17.

Allen G. Newhall, of whom it was stated in the last issue of the Courier that he had resigned on September 15 to resume his duties at the University of Nebraska, is Instructor in Botany in Grinnell College, Iowa, instead.

Miss Mary E. Nichols has been appointed Stenographer and Typist, effective September 24, to assist Joseph J. Wilson, Assistant State Leader of the Barberry Eradication Campaign, at Ames, Iowa.

George M. Peterson, who has been assisting in the barberry campaign in Indiana, is to be transferred to Minnesota to aid in the campaign there.

Orda A. Plunkett, who was appointed field assistant on July 1 and assigned to barberry eradication in Indiana, is resigning on September 30, to resume his college studies at Wabash College.

Fred E. Robbins, who has been engaged on the cereal disease survey during the summer and more recently has been demonstrating cooperative hot water treatment for loose smuts, at Shelbyville, Indiana, resigned on September 8 to return to his duties as Associate Professor of Crops at Purdue University.

Clare A. Rood, who has been assisting with the barberry campaign in Michigan since July 1, 1919, resigned on September 23 to return to Michigan Agricultural College to continue his studies.

Raymond C. Rose, who has been Assistant State Leader in the barberry eradication campaign in North Dakota during the year, has been transferred to the investigation of black rust and will assist in epidemiology studies in the North Central District, with headquarters at Lansing, Michigan, beginning October 1.

Paul H. Rusterholz, appointed on July 26, 1919, to aid in barberry eradication in Minnesota, resigned on September 3 to return to his former position as Botany Instructor in Central High School, St. Paul, Minn.

Raymond M. Schenck, who was appointed on July 5, 1919, for barberry eradication in Michigan, resigned on September 22 to accept a position as instructor in the Ada, Minn., High School.

Dr. E. C. Stakman was in Washington from September 22 to 24, inclusive, to confer regarding the program of over-wintering studies of black stem rust and other cooperative phases of this investigation.

Miss Marie E. Stevick, a graduate of the Art Institute, Chicago, has been appointed Field Assistant, effective September 24, for corn rot investigations at Bloomington, Illinois. She will make colored illustrations of diseased corn and also paintings of diseased and healthy corn plants in various stages of development.

Otto P. Tiemann, Assistant Pathologist, who has been helping Mr. Holbert in the investigation of corn rots at Bloomington, Ill., resigned effective July 1, to take up work with Funk Bros. Seed Company, at that point.

Dr. Elda R. Walker, who has been actively associated with the barberry campaign in Nebraska since it began, resigned on August 31 to take up her duties in the Department of Botany in the University of Nebraska.

C. W. Warburton, Agronomist in Charge of Oat Investigations, returned to the Office on September 24, after an absence of more than a year, during which he supervised the distribution of the President's Seed Grain Loan Fund in North Dakota, Montana, and Washington, with headquarters at Great Falls, Mont. Loans were made to about 1,500 farmers in North Dakota; 6,500 in Montana; and 50 in Washington, to enable them to sow winter wheat or winter rye in the fall of 1918, or spring wheat in the spring of 1919. Because of the widespread drouth and extreme heat during the spring and summer of 1919 the yields obtained in western North Dakota and in Montana were disappointing, and in many cases the crops were total failures. The estimated yield of spring wheat from 1,500,000 acres in Montana, including all wheat sown on irrigated land, is slightly less than 8 million bushels, or less than one-fourth of a normal crop. The general crop failure over Montana and southwestern North Dakota in 1919, following similar but somewhat less severe conditions in 1917 and 1918, has caused heavy losses to farmers, and in some sections a large percentage of the homesteaders and land owners have been compelled to leave their farms and seek employment in other more fortunate sections. Very generally these men intend to return to their farms to put in a crop in 1920, though some will wait until they are sure of more favorable conditions, and a few have gone permanently.

The weather reports at Havre, Mont., show that three dry years have not occurred in succession at any previous time within the past 50 years, and farmers very generally are confident that there will be sufficient rainfall to

produce a crop next year. Several counties in Montana have already provided for the issuance of county bonds for drouth relief, and similar action will no doubt be taken between now and seeding time in other counties in Montana and western North Dakota. Heavy rains fell during September in northwestern and north-central North Dakota, so that plowing and seeding of fall rye have been possible recently, but as yet Montana has had only light local showers, and the soil is too dry for fall work.

The yields from fall wheat in Fergus County, Mont., (the Judith Basin), this year, were so much better than from spring wheat that there would have been a material increase in the fall wheat acreage if conditions for seeding had been favorable. Because of the continued drouth, however, it is not likely that as much wheat will be sown this fall as a year ago. In North Dakota, widespread damage by grasshoppers and the general unsatisfactory yields which were obtained from fall rye sown in stubble, will cause a material reduction in the acreage of that crop. There is a very general belief that the enormous increase in the rye acreage in North Dakota during recent years has been a large contributing factor in the grasshopper invasion, as the stubble fields in which the rye is sown make the best of breeding grounds for this pest. Much more than the usual amount of fall working is being done in North Dakota, and the best corn crops ever produced there is being harvested.

Before returning to Washington Mr. Warburton conferred with officials of the Federal land banks in Spokane, Wash., and St. Paul, Minn., the President's Seed Grain Loan funds having been administered jointly by the Department of Agriculture and by the Treasury Department through the Federal land banks.

Simon E. Wolff, who was appointed field assistant on August 4, for barberry eradication in Michigan, resigned on September 29 to return to the Michigan Agricultural College.

NEW DEPARTMENTAL ORDERS AND REGULATIONS

Several new orders and regulations of the Department are extremely important to the scientific staff, especially to those on field service.

FIELD PURCHASE OF PRINTING, SUPPLIES, AND EQUIPMENT.

A circular letter from this Office, under date of September 30, gave brief but careful instructions made necessary by new Congressional and Departmental regulations regarding, (1) printing for use in field service, and (2) purchase of supplies in the field. Field employees must give very careful attention to this memorandum, in order to avoid financial loss in connection with purchase of printing, supplies, equipment, and material. They should also be careful to bring this memorandum to the attention of all new employees and clerical workers under their supervision.

SUBMISSION OF MANUSCRIPTS FOR OUTSIDE PUBLICATION.

A memorandum from the Office of the Secretary concerning submission of manuscripts for publication outside Departmental channels, is given below. Authors of manuscripts which it is desired to publish in private journals, should keep this in mind and thus save delay in obtaining permission to publish.

"CIRCULAR NO. 49. August 16, 1919.

Submission of Manuscripts for Outside Publication.

The Secretary requests that, in connection with recommendations regarding the publication of articles in outside channels, the ribbon copy and a distinct carbon copy of the manuscript be submitted to the Office of the Secretary. This will facilitate the examination of the manuscript and make it possible for the editorial force to indicate on the ribbon copy, which will be returned to the Bureau, any corrections it may seem desirable to make before the article is published.

F. R. Harrison,
Assistant to the Secretary."

AMENDMENTS TO THE FISCAL REGULATIONS.

Several amendments to the Fiscal Regulations, important to scientific staff, have been announced by the Secretary of Agriculture and are reproduced herewith for the information of the staff.

REIMBURSEMENT FOR PERSONALLY-OWNED AUTOMOBILE.

Memorandum No. 284, dated July 1, 1919, announces this amendment to Paragraph 214 as follows:

"Effective July 1, 1919, the provisions of Paragraph 214 of the Administrative Regulations, whereunder employees using their own motor-propelled vehicles for official travel may be reimbursed for such use at mileage rates not exceeding 2 cents per mile for a motor cycle and 6 cents per mile for an automobile, are hereby amended by increasing the rates to not to exceed 3 cents and not to exceed 7 cents for motor cycles and automobiles, respectively."

STREET-CAR AND CAB FARES AND TRANSFER OF BAGGAGE.

Memorandum No. 289, dated August 1, announces amendments to Paragraphs 83 and 86 of the Fiscal Regulations as follows:

"Effective August 1, 1919, sections (p) and (q) of Paragraph 83, and section (e) of Paragraph 86 of the Fiscal Regulations, as amended by Memorandum No. 271, dated April 1, 1919, are hereby further amended to read as follows:

"Paragraph 83:

(p) Street-car, transfer-coach, omnibus, cab, carriage, and taxicab fares, in amounts not exceeding locally prevailing rates, except when incurred between place of lodging, or where meals are taken, and place where duty is to be performed (see section i): Provided, That where duty is performed at more than one place on any one day street-car or other fares may be allowed between such places of duty: Provided also, That satisfactory explanations as to necessity accompany charges for taxicab or other means of transportation more expensive than street cars: Provided, however, That an employee may properly choose his residence in a suburb of his official station, and personal transfers will be allowed between such residence and the depot at his official station at the beginning and termination of official travel. Payments in excess of 50 cents due to higher locally prevailing rates must be explained in writing;

(q) Transfer of baggage at locally prevailing rates for one piece of personal baggage, and for each additional piece of baggage containing Government property or private property for Government use: Provided, however, That an employee may properly choose his residence in a suburb of his official station, and transfers of baggage will be allowed between such residence and the depot at his official station at the beginning and termination of official travel. (For rates in the District of Columbia, see Appendix G.), Payments in excess of 50 cents due to higher locally prevailing rates must be explained in writing;

"Paragraph 86:

(e) Street-car, transfer-coach, omnibus, cab, carriage, or taxicab fares will be allowed for each personal transfer if the charge is not in excess of locally prevailing rates: Provided, That satisfactory explanations as to necessity accompany charges for taxicabs

or other means of transportation more expensive than street cars. Tips to drivers or chauffeurs will not be allowed. Transfers of baggage at locally prevailing rates for one piece of personal baggage and for each additional piece of baggage containing Government property for Government use will be allowed. (For rates in the District of Columbia, see Appendix G.) Every charge for baggage transfers included in reimbursement accounts must be supported by a statement indicating the kind of baggage transferred (whether hand bag, suit case, trunk, etc.) and the number of pieces. An employee may properly choose his residence in a suburb of his official station, and personal transfers and transfers of baggage will be allowed between such residence and the depot at his official station at the beginning and termination of official travel. Payments in excess of 50 cents for personal transfers and transfers of baggage must be explained in writing. Personal transfers and transfers of baggage between hotels will be allowed only when satisfactorily explained. Storage charges on baggage to avoid frequent transfers may be allowed when properly explained."

ACTUAL TRAVELING EXPENSES DEFINED.

Memorandum No. 291, dated August 25, amends Paragraph No. 86-J of the Fiscal Regulations, effective September 2, as follows:

"(j) Except as provided in Paragraph 86 (v), special conveyance, such as livery, or the hire of a boat, bicycle, motorcycle, or automobile, may be employed when no public or regular means of transportation are available, or when such public or regular means of transportation can not be used as advantageously in the interest of the Government. Employees using their own vehicles in official work in accordance with Paragraph 214 of the Administrative Regulations must, in the case of motor-propelled vehicles, unless granted reimbursement for such use at mileage rates (not exceeding 3 cents per mile for a motorcycle and 7 cents per mile for an automobile), support each account covering operating charges by a certificate setting forth the fact that the charge for gasoline and oil was arrived at by actual measurement at both the beginning and end of the official trip. The mileage of each trip should also be plainly stated. In addition to actual operating charge or mileage rates (not exceeding 3 cents per mile for a motorcycle and 7 cents per mile for an automobile) allowed in lieu of actual operating charges, employees using their own motor-propelled vehicles in official work may be reimbursed for storage charges when storage becomes necessary at points other than official or temporary headquarters. Where it becomes necessary by reason of breakdowns, impassable roads, or miring to have vehicles towed partly, or, under extraordinary circumstances, entirely to destination, reimbursement may be made for reasonable expense of such towage, but all such charges must be fully explained, and each case will be considered on its merits. No allowance or reimbursement will be made for the cost of repairs or replacements to any vehicle, or for towage of same to any place for the purpose of having repairs made. If, however, it is possible to have the vehicle repaired at a place on the direct route to destination, towage charges to such place will not be construed as incurred primarily for that purpose and may, as herein provided, be allowed."

REPORTS OF PROGRESS IN PROJECTS

In the last issue of each month, it is proposed to summarize the outline, scope of investigation, and general results of some of the projects and subprojects of this Office. In this way it is hoped to keep the entire staff, both agronomic and pathologic, in Washington and in the field, well informed as to investigations being made and results obtained.

218-A. INVESTIGATION OF IMPERFECT AND SAC FUNGI
(Dr. A. G. Johnston, Pathologist in Charge.)

Take-All Subproject. (Harold H. McKinney, Assistant Pathologist, Leader.)

The history of the discovery of this destructive Australian and European disease of cereals in wheat fields in Illinois and Indiana is discussed in Farmers' Bulletin 1063, entitled "Take-All and Flag Smut, Two Wheat Diseases New to the United States", by Drs. Harry B. Humphrey and Aaron G. Johnson, issued in August, 1919. All members of the staff will find in this bulletin a very interesting account of the discovery, distribution, destructiveness, symptoms and control of these two diseases.

Prompt measures looking to the effective control of these diseases were immediately taken by the Office. Besides the nation-wide survey discussed briefly in the bulletin mentioned, the Federal Horticultural Board announced a hearing to be held on July 15 to determine if federal quarantine measures were necessary. Local quarantines of the infected areas and the fields adjacent thereto were laid by the states of Indiana and Illinois, respectively, and it was not necessary to lay a federal quarantine. The regulations covering the matter are essentially as follows:

1. Fields within the quarantined areas to be thrashed last in thrashing rings. All quarantined grain to be thrashed on the ground where grown, and the separator not to be used again for thrashing wheat this season.

2. All thrashing machines and wagons used in thrashing from diseased fields to be thoroughly disinfected with formaldehyde.

3. All grain from quarantined fields to be disinfected with formaldehyde as it comes from the separator.

4. All straw from infected fields to be burnt and, as far as practicable, stubble on infected fields to be burnt.

5. No wheat, barley, rye, or oats to be grown on infected fields for 5 years, except by approval of the Federal Horticultural Board. Co-

Cooperative arrangements were made with the State experiment stations, the State departments of agriculture, and the State extension services for the carrying out of the control measures described above.

In addition a comprehensive series of milling and baking experiments, including chemical analyses, was conducted in Washington cooperatively with the Bureau of Markets and the Bureau of Chemistry, to determine the effect of the formaldehyde treatment on milling quality and baking value.

Field experiments have been begun on two closely adjacent farms in Madison County, Illinois. These experiments are conducted cooperatively with the Illinois Experiment Station and are designed to determine the persistence of soil infection, the value of different rotations in controlling the disease, the immunity and susceptibility of different crops and crop varieties, the effect of fertilizers on the development of the disease, and other related facts. Seeding for the fall of 1919 has already been done. The Indiana Experiment Station is conducting certain rotation experiments on a tract in Laporte County, Indiana.

The nation-wide survey made during the summer discovered two other localities in which a disease suspiciously like take-all was present. One of these was near Roanoke, Va., the other in Mason County, Wash., on Puget Sound. Continued study of the infected field near Roanoke, Va. proves conclusively that it is affected with a take-all (Ophiobolus sp.), and the necessary control measures have been inaugurated there, in cooperation with the State Experiment Station and the State Department of Agriculture. The identification of the Puget Sound infection is not yet completed, but it is sufficiently similar in appearance to warrant asking the State Department of Agriculture to help inaugurate measures which will effectively control the spread of the disease, should it prove to be take-all.

The Nematode, or Eelworm, Disease of Wheat.

(R. W. Leukel, Field Assistant, Leader.)

The investigation of this nematode disease was begun by Mr. Luther P. Byars, Pathologist in the Office of Cotton, Truck, and Forage-Crop Disease Investigations, as he is the nematode specialist of that Office. As soon as it became apparent that this was strictly a cereal disease, arrangements were made to transfer it to the Office of Cereal Investigations. The nematode, the injury it causes, and the preliminary control measures were published cooperatively by Mr. Byars in Farmers' Bulletin 1041, issued in March of this year, under the title, "The Eelworm Disease of Wheat and Its Control". This bulletin now is being revised and a new edition will be issued presently.

Extensive experiments on this nematode disease of wheat were begun at Arlington Farm in the fall of 1918. A larger area has now been set aside for this work on an especially isolated portion of the Farm, and will be surrounded by a high rodent-proof fence. Stringent precautions have been taken to guard against the spread of the disease to any other part of the Farm.

The experiments conducted during 1919 have proved that, in addition to wheat, such other cereals as rye, oats, spelt, and emmer are more or less susceptible, while barley seems to be immune.

The chief phases of the problem under investigation at the present time are:-

1. The longevity and spread of the nematode in the soil.

2. The progressive development of the young galls in the wheat head.

3. The time of the opening of the galls, the escape of the nematodes and their subsequent entrance into the wheat seedling.

4. The relative susceptibility of different wheat varieties and of rye, oats, barley, emmer, spelt, etc.

5. Cross inoculations with grasses and grass infesting nematodes.

Certain experiments are being conducted on a large scale on farms at Woodstock and Morrisville, Virginia. These experiments include study of the effect of crop rotation on infested soil, and demonstrations of control by the use of uninfected seed, or of treated seed, on clean land.

In addition to the experiments, a field survey is being made in the States of Maryland, Virginia, West Virginia, and Georgia, to determine the distribution of this nematode and the severity of infection where it exists. The men engaged on this survey are, R. A. Carroll, D. H. Fullerton, G. H. Gillespie, G. F. Miller, and K. E. Smith. On October 10 there will be added H. L. Lewis and W. W. Wood.

A preliminary survey was made in Jackson County, Georgia, last year and an eradication campaign is now being carried on in that County. This campaign aims to get the farmers to dispose of their infested grain and, so far as possible, to sow only clean wheat on uninfested soil. This campaign is being conducted by Mr. R. A. Carroll in cooperation with Prof. J. B. Berry.

218-B. INVESTIGATIONS OF RUSTS.

(Dr. H. B. Humphrey, Pathologist in Charge.)

Black Stem Rust Subproject

(Dr. H. B. Humphrey, Pathologist, Leader.)

The three lines of investigation discussed below are under the immediate direction of Dr. E. C. Stakman, Pathologist, and the following data were submitted by him.

Survey of Barberry and Stem Rust. Reports from the men engaged on the survey of the distribution of barberry and stem rust during the summer are all in and the data are now being compiled. A report on the work will be ready soon.

The principal work was done in Kansas, Missoufi, Kentucky, West Virginia, Pennsylvania, and New York. A considerable amount of barberry infection was found in Kansas, but the relation to cereal rust was not always clear. Few infected barberries were found in Missouri and Kentucky. In southern West Virginia an extensive amount of infected Berberis canadensis was found. Common barberries were very commonly and severely rusted in Pennsylvania and

New York. Mr. Krakover found infected Berberis canadensis at Pulaski, Virginia, and Dr. Ludwig found some at Marion, Virginia.

Biologic Form Investigations. Fifty-one new specimens of stem rust, collected in forty-three localities from twenty States in the Union, two Provinces in Canada, and one Department in France, were cultured during the month of September in the greenhouse and laboratories in the Section of Plant Pathology, University of Minnesota, St. Paul. These collections comprised twenty-four specimens of Puccinia graminis tritici, thirteen specimens of Puccinia graminis avenae, five specimens of Puccinia graminis phlei-pratensis, two specimens of Puccinia graminis secalis, and seven specimens whose identity has not yet been determined. Greenhouse conditions have been quite favorable during the past month and fair progress has been made in the determination and classification of biologic forms of Puccinia graminis.

In view of the well-established principles of the "pure line" theory, it has seemed advisable to establish pure line cultures of the new races of Puccinia graminis tritici. The difficulty of this is greatly enhanced by the fact that the rusts cannot be grown on artificial media. Single spores must be tediously picked out under the low-power microscope by means of a very finely drawn thread of glass and each isolated spore put onto the moist leaf-tip of the host plant. The resulting percentage of infection is very small indeed. Two successful isolations were secured out of about 200 attempts made during September. This seems to suggest that while the plan is very tedious, it is possible to establish pure lines of the rust fungus.

Rust epidemiology studies. The summer has been devoted to collections of rusts and studies of distribution. The autumn is employed in establishing stations for studying overwintering of the rust spores.

Most of the overwintering stations have been, or soon will be established. The rust has come thru the summer well in a great many regions. This is especially true in the Northern Great Plains region. Here there is an abundance of rust on volunteer grains and grasses. This will furnish an excellent opportunity for the studies during the winter. In the Southern Great Plains area the rust has been carried thru the summer in the uredinial stage at several stations. This was accomplished very largely by the use of over-summering plots.

The reports for the North Central district west show that overwintering stations have been established at eight places in Minnesota, five in North Dakota, and seven in Iowa. The hosts found most commonly rusted with stem rust were volunteer wheat, winter wheat, volunteer oats, barley, and rye, Hordeum jubatum, Agropyron Smithii, A. repens, A. tenerum, Dactylis glomerata, Elymus robustus, E. macounii, Agrostis alba, and Phleum pratense.

The United States is divided into 7 districts in the epidemiology studies. The men assigned to each district, the district headquarters, and the States included, are given below.

Northeast district: Leo J. Krakover and Creighton F. Murphy. Headquarters, Department of Plant Pathology, Cornell University, Ithaca, New York. States included: Maine, New Hampshire, Vermont, Massachusetts, Connecticut,

Rhode Island, New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, and West Virginia.

Southeast district: Clinton A. Ludwig and Walter C. Pfaender. Headquarters, Department of Plant Pathology, Alabama Polytechnic Institute, Auburn, Ala. States included: North Carolina, South Carolina, Tennessee, Georgia, Florida, Alabama, Mississippi, and southeastern Louisiana.

North central district east: Raymond C. Rose and Lellen S. Cheney. Headquarters: Department of Botany, Agricultural College, East Lansing, Michigan. States included: Michigan, Wisconsin, Illinois, Indiana, Ohio, and Kentucky.

North central district west: Albert F. Thiel and Warren N. Christopher. Headquarters, Division of Plant Pathology, College of Agriculture, University Farm, St. Paul, Minnesota. States included: Minnesota, Iowa, North Dakota, South Dakota, Nebraska, northeastern Colorado, eastern Wyoming, and eastern Montana.

South central district: Robert S. Kirby and W. A. Ballamy. Headquarters, Department of Botany, University of Oklahoma, Norman, Okla. States included: Missouri, Kansas, Oklahoma, southeastern Colorado, eastern New Mexico, Texas, Arkansas, and Louisiana.

Southwest district: Henry W. Thurston, Jr. and _____. Headquarters, Department of Botany, University of Arizona, Tucson, Arizona. States included: western New Mexico, Arizona, southwestern Colorado, southern Utah, southern Nevada, and southern California.

Northwest district: George R. Hoerner and Frank J. Dietsch, Headquarters, Department of Botany, Agricultural College, Corvallis, Oregon. States included, Western Montana, Western Wyoming, Northwestern Colorado, Northern Utah, Northern Nevada, Idaho, Washington, Oregon, and Northern California.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

- -

Vol. 11. October 10, 1919. No. 19.
Personnel (Oct. 1-10) and Station (Sept. 16-30) Issue.

- -

SPECIAL CONTENTS

Committees on Cereal Agronomy,,Genetics and Pathology.
Wheat yields at Dickinson, N. Dak.
Spring grain yields at Lind, Washington.

PERSONNEL ITEMS

Karl D. Bailey, who has been assisting in the barberry eradication campaign in Iowa since he was appointed on May 16, 1919, resigned on September 26 to complete his course at the Michigan Agricultural College.

Reiner Bonde, who was appointed on March 25, 1919, as field assistant to aid in barberry eradication in Minnesota, resigned on October 8, 1919, to resume his studies at the University of Minnesota.

Newton C. Brackett, who was first appointed on September 10, 1917, and served in the smut-control campaign and more recently in barberry eradication in Ohio, began his annual leave on October 2, and will resign soon to return to Clemson College, North Carolina, to continue his studies.

Raymond S. Bundy, who was appointed on June 11 for service in the cereal disease survey and smut control campaign in the Upper Mississippi Valley, resigned on August 31 to resume his studies at Purdue University, Lafayette, Indiana.

George J. Burt returned to Washington on October 8 after completing his work of harvesting experimental corn plats, gathering and selecting seed corn, recording data, and consulting with county agents and state workers in furthering corn improvement in the states of Alabama, Indiana, Illinois, Michigan, and Wisconsin.

Wallace Butler, who has been employed in investigation of black rust and barberries during the summer, returned to the principalship of the Boerne, Texas, High School on September 30.

Gordon C. Curran, who was appointed on April 7 to aid in the barberry campaign in Minnesota, resigned on October 8, to resume his studies at the College of Agriculture, University of Minnesota.

H. S. Garrison and J. M. Hammerly recently harvested the experimental corn plats on the experiment farm at Yarrow, Md., and obtained some corn of excellent quality.

Miss Marcellene R. George, who has been helping Dr. Hoffer with the records of the Corn Rot Investigations at the Indiana Experiment Station for the past year, has finished her work there, and returned to Washington on October 8.

James Godkin, who was appointed for the smut control campaign in 1918, and recently has been eradicating barberries in Wyoming, resigned on September 30 to take up graduate study at the University of Wisconsin.

Robert H. Groesbeck, who was appointed on April 23, 1919, to assist in barberry eradication, resigned on October 6 to resume his studies at the University of Minnesota.

C. P. Hartley, Physiologist in Charge of Corn Investigations, left Washington, D. C., on October 4, for Piketon, Ohio, for the purpose of harvesting experimental corn plats and obtaining data regarding the improvement of corn and methods of corn production.

Edwin E. Honey, who was appointed for barberry eradication in Illinois, on July 22, 1919, resigned on September 30 to accept a position as assistant in botany in the University of Illinois.

Edmond B. Lambert, who was appointed on August 4, 1919, to assist in barberry eradication, resigned on October 1 to return to his studies at the University of Minnesota.

George C. Maycue was appointed Assistant State Leader of the barberry eradication campaign in North Dakota on October 1 to succeed Mr. Raymond C. Rose, who has been transferred to overwintering studies of black stem rust.

Leonard W. Melander, who was appointed on August 4, for barberry eradication in Minnesota, resigned on October 4, to resume his studies at the University of Minnesota.

George M. Peterson, who was appointed March 1, 1919, to assist in barberry eradication in Indiana, resigned on October 1 to enter the University of Minnesota.

Homer H. Plagge, who was appointed on July 1, 1918, for work on the Iowa barberry eradication campaign, severed his connections with that work on September 30, to take up graduate study at the Iowa State College.

Gail F. Puttick, who was transferred to Nebraska on September 1, to assist in the publicity work for the barberry eradication campaign there, resigned on October 1 to return to the University of Minnesota for graduate study.

Harry A. Shuder, who was appointed on August 11, to assist in the barberry eradication campaign in Ohio, has accepted a position with the Interchurch World Movement, having been assigned to work in Colorado.

Frank J. Snider, who was appointed assistant in the barberry eradication campaign in Iowa on July 1, 1919, resigned September 30, as the work there was completed for the season.

Victor F. Tapke, who has been engaged on an investigation of the application of the hot water treatment to prevent loose smut, at Shelbyville, Ind., and more recently on the same investigation in Virginia, returned to Washington on October 7. He has been transferred to the project on the investigation of cereal smuts, and will have permanent headquarters at Washington hereafter.

Reuben E. Trippensee, who was appointed on August 5 for barberry eradication in Michigan, resigned on September 29.

Archie M. Waldie, who was appointed on August 20, to aid in the barberry eradication campaign in North Dakota, resigned on September 27, 1919.

Robert W. Webb, who was appointed for take-all investigation and control on June 23, resigned on September 22 to continue graduate study at the Shaw School of Botany, Washington University, St. Louis, Missouri.

VISITORS

Dr. E. D. Ball, State Entomologist of Iowa and Collaborator in the barberry eradication campaign, was in Washington on October 7 to 9 for conference in connection with the proposed survey and control of the European corn borer.

Dr. A. D. Cockayne, Biologist of the Department of Agriculture of New Zealand, is spending several weeks in this country and recently has been in conference with the leaders of different investigations with reference to the kind, method, and scope of work done in the United States.

Miss Janet Wilson, who formerly assisted Mr. Clark in western wheat investigations, and who began her training as nurse at John Hopkins University last spring, was an office visitor on October 8.

Special Memorandum No. 14. October 10, 1919.

COUNCIL AND COMMITTEES OF THE OFFICE OF CEREAL INVESTIGATIONS

In order to promote more effective correlation of the various lines of investigation with which the Office of Cereal Investigations is charged, a Council is formed and three coordinate committees are appointed.

CEREAL INVESTIGATIONS COUNCIL

The Council is composed of the Cerealist in Charge and the chairman of the three scientific committees of the Office. Its functions shall be (1) to determine the administrative principles which should govern the development of lines of cereal research, investigation and experimentation, conducted either independently or cooperatively; (2) to decide the purpose and size of desirable increases in appropriations to be proposed and the allotment of funds thereunder; and (3) to consider other special problems as the occasion requires.

Personnel of Council

C. R. Ball, Cerealist in Charge.
C. W. Warburton, Agronomist, Chairman of Committee on Cereal Agronomy.
C. E. Leighty, Agronomist, Chairman of Committee on Cereal Breeding.
H. B. Humphrey, Pathologist, Chairman of Committee on Cereal Pathology.

CEREAL INVESTIGATIONS COMMITTEES

Committees on cereal agronomy, cereal breeding and cereal pathology are appointed with the personnel indicated below. Each of these committees consists of a group of resident office members with two consulting members from the cooperative field staff. It is the function of these committees to plan, correlate and supervise all research, investigation, and experimentation in these three respective lines of cereal production and improvement. In order to promote complete coordination of Office plans and procedure, the chairman of each committee is made a member of the other two committees. The Committee on Cereal Breeding is charged with plans and procedure in breeding for all purposes, including disease resistance.

Committee on Cereal Agronomy

C. W. Warburton, Chairman, Agronomist in Charge of Oat Investigations.
C. E. Chambliss, Agronomist in Charge of Rice Investigations.
C. P. Hartley, Physiologist in Charge of Corn Investigations.
H. B. Humphrey, Pathologist, Chairman of Committee on Cereal Pathology.
C. E. Leighty, Agronomist, Chairman of Committee on Cereal Breeding.
F. D. Richey, Scientific Assistant in Corn Investigations.
B. E. Rothgeb, Scientific Assistant in Charge of Grain Sorghum and Broomcorn Investigations.

Consulting Members:
L. C. Aicher, Supt. Aberdeen Substation, Aberdeen, Idaho.
D. E. Stephens, Supt. Sherman County Branch Station, Moro, Oregon.

Committee on Cereal Breeding

C. E. Leighty, Chairman, Agronomist in Charge of Eastern Wheat Investigations.
E. B. Brown, Assistant Physiologist in Corn Investigations.
J. A. Clark, Assistant Agronomist in Charge of Western Wheat Investigations.
H. V. Harlan, Agronomist in Charge of Barley Investigations.
H. B. Humphrey, Pathologist, Chairman of Committee on Cereal Pathology.
C. H. Kyle, Assistant Physiologist in Corn Investigations.
G. M. Reed, Pathologist in Charge of Cereal Smut Investigations.
C. W. Warburton, Agronomist, Chairman of Committee on Cereal Agronomy.

Consulting Members:
H. H. Love, in Charge of Department of Plant Breeding, Cornell University, Ithaca, N. Y.
J. H. Parker, in Charge of Crop Improvement, Kansas Experiment Station, Manhattan, Kans.

Committee on Cereal Pathology

H. B. Humphrey, Chairman, Pathologist in Charge of Cereal Disease Investigations.
A. G. Johnson, Pathologist in Charge of Investigations of Imperfect and Sac Fungi.
C. E. Leighty, Agronomist, Chairman of Committee on Cereal Breeding.
G. M. Reed, Pathologist in Charge of Cereal Smut Investigation.
C. W. Warburton, Agronomist, Chairman of Committee on Cereal Agronomy.
W. H. Weston, Pathologist in Charge of Downy Mildew Investigations.

Consulting Members:
H. S. Jackson, Agent in Charge of Leaf Rust Investigations, Experiment Station, La Fayette, Ind.
W. W. Mackie, Agent in Cooperative Rust Investigations, Experiment Station, Berkeley, Calif.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). No report.

GEORGIA

State Experiment Station, Athens, and Substations (R. R. Childs). No report.

TENNESSEE

State Experiment Station, Knoxville, and Substation, Jackson, (C. A. Mooers). No report.

NORTH CAROLINA

State Experiment Station, West Raleigh, and Substations (G. M. Garren). No report.

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor). The weighing of the grain from the wheat and barley nurseries was completed during this period. The first set of plats in the rate of seeding and soil preparation experiments with wheat was sown on September 15 and 16. Oats for the field plats were treated with formaldehyde solution. Fall oats plats were sown on September 26 to 28, and the fall barley plats on September 29 and 30. The maximum temperature for this period was 93° and the minimum 44°. The rainfall was 1.63 inches, with a total for the month of 1.68 inches.

NEW YORK

Agricultural Experiment Station, Ithaca (H. H. Love). The wheat hybrid nursery and the rod rows and plats of fall wheat and rye have been sown at the station. During the past week H. H. Love and W. T. Craig sowed rye breeding plats in Columbia and Albany counties. These plats include a large number of new selections. The weather was unusually warm, and fall seedings both on the plats and on the farms are making good growth.

ILLINOIS

Cooperative Corn Rot Investigations, Bloomington (J. R. Holbert). The long dry spell that we have been having was broken a few days ago by rain. It is still raining and I doubt whether we will be able to do any more field work for a few days yet.

Miss Johann is here for a few days making isolations from diseased corn plants. Mr. Toole arrived Friday to help us this week. Everything is coming along very nicely.

MISSOURI

State Experiment Station, Columbia (L. J. Stadler). No report.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett). Rain fell on September 17 and 18, the first since the middle of August, which made possible the preparation of the land for the seedding of fall wheat, delayed until now by drouth.

GREAT PLAINS AREA (South to North)

TEXAS

Amarillo Cereal Field Station, Amarillo (John F. Ross). Heavy rains the middle of September, following the hurricane which caused much destruction on the Gulf Coast, put the ground in excellent condition for fall seeding and caused a vigorous growth of Sudan grass but delayed the harvesting of row crops. Wind which accompanied the rain blew down and tangled the taller row crops to some extent. Maximum temperature for the month 99° on the 2d; minimum, 45° on the 23d; average wind velocity, 6.9 miles; precipitation, 4.72 inches, all of which fell from the 14th to the 17th, inclusive; evaporation, 6.423 inches.

The harvesting of the row crops is nearly finished. Help is scarce and hard to get, particularly since the opening of the schools. During the summer high school boys were employed as extra help. Visitors at the farm during the month were B. E. Rothgeb, E. F. Chilcott, and H. N. Vinall.

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). The month of September was dry with a total rainfall of 0.63 inch, practically all of which fell on September 18. During the last few days the wind has been blowing hard and steadily from the south. No wheat will be sown in the county until more rain falls.

The only crops not yet harvested are the last date-of-seeding plats and two of the late sorgos in varietal experiments. These sorghums are drying rapidly and all should be harvested before frost. The maximum temperature for the month was 99° on September 10, minimum temperature 46° on September 23.

KANSAS

Fort Hays Branch Station, Hays (A. F. Swanson). Timely rains during the latter half of September have put the ground in good condition for seeding wheat and farmers in this vicinity are busy with their drills.

All seeding of wheat on the cereal project will be completed tomorrow, with the exception of the rate and date experiments, which will continue weekly until November 17. The work with wheat on the cereal project includes 54 twentieth-acre plats, 300 fiftieth-acre plats, and forty varieties of wheat have been selected as being worth while for trying out under western Kansas conditions.

The experiment with the lister-drill method of seeding fall wheat, which has been planned by Professor S. C. Salmon of the Kansas State Agricultural College, will be more complete than heretofore. Rates of seeding with this drill ranges from 1 to 5 pecks in plats running north and south and in plats running east and west, in comparison with the common drill. The top-dressing experiment has been included in this year's work both with the lister drill and the common drill. With improvements made on the drill this year and with ideal conditions for seeding, this experiment should give some very good comparative results next year.

All sorghums on the project are now harvested. Many calls have come in for exhibits and seed. Exhibits were sent to Wichita, Kansas City, and Chicago.

State Experiment Station, Manhattan (John H. Parker). No report.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). The weather since September 15 has been dry and cool, with occasional warm days. No precipitation worth mentioning has occurred since early in the month. Farmers are rushing their fall seeding of wheat, and most of it in this part of the state will be completed by October 10. Wheat in many fields has emerged and in a few fields the stands are much too heavy.

Work at the Akron Station is apace with the season. Seeding of fall grain is practically completed. Emergence of the varietal plats seeded September 16 was complete September 25. Although there is some variation among the varieties, the stands in all plats are very satisfactory. Two additional varieties Black-chaff Turkey (Kansas No. 328) and Wharkov (Montana No. 36), were sown in the field project October 2. Seeding of the nursery project is nearly completed. The ground is so dry that the grain in the nursery probably will not emerge till late in October.

The Washington County Fair was a decided success from every standpoint and is likely to be held annually in the future. The exhibits of agricultural products were excellent, considering the season. The corn exhibits were ten times as numerous as those of wheat, although wheat is the most important crop in this county. An exhibit of Akron Field Station grain was on display which attracted some attention. The live stock exhibits were not numerous, but some excellent animals were shown, especially hogs. Supt. O. J. Grace of the Akron Station received numerous high awards on his pen of Duroc Jersey. The program was specially attractive for a county fair and as a result there were between 8,000 and 10,000 paid admissions during the three days.

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson).

Sheridan Field Station, Sheridan (Leroy D. Willey). No report.

SOUTH DAKOTA

Bellefourche Experiment Farm, Newell (A. D. Ellison). Fall wheat varieties seeded in plats on irrigated land have emerged with fairly good stands. The cereal varieties in the irrigated nursery are just beginning to emerge. Fall-sown cereal varieties on dry land have not begun to emerge. A few showers have occurred since fall crops were seeded, but not in sufficient amount for germination of those on dry land.

The weather conditions have been generally fair during the last half of September. The maximum temperature for the period was 87 degrees; minimum, 33 degrees; precipitation 0.48 inch.

Farmers in general on the project are well along with their fall work. The third cutting of alfalfa has been made, while the fourth growth promises to make good pasture. Corn and early fall potatoes are being harvested. On account of the shortage of seasonal rains and range pasture, many cattle and sheep have been moved and sold to avoid further shortage of feed.

Cottonwood Substation, Cottonwood (Manley Champlin). Threshing is in progress. The work is delayed by accidents and shortage of help. The quality of the grain is very good. Yields are not yet available.

(Omitted from Page 235)

WYOMING

Cheyenne Experiment Station, Cheyenne (A. L. Nelson). The month has been very favorable for fall wheat and for tillage operations. The rainfall (3.1 in.) has also improved grazing conditions. There has been no precipitation during the past 10 days, and during this dry period thrashing on the station was completed. The lowest temperature so far is 31° and corn and other tender plants have not yet been injured. Fall plowing on the station is almost completed.

Most of the silage crops are harvested and potatoes are being dug in this section. The potato yields are light and the crop is of poor quality. Notwithstanding favorable conditions the farmers are doing practically no fall plowing.

Vivian Substation, Vivian (Manley Champlin). Fall plowing and threshing are about completed. The quality of grain is excellent. Cole oats, Odessa barley, and Swedish rye are the principal varieties increased during the present season. Plans are under way to rearrange and improve the seed house and dairy barn interiors.

Eureka Substation, Eureka (Manley Champlin). Threshing is complete and fall plowing is practically finished. The remainder of the season will be devoted to picking corn and making the late seedings of fall grain.

Foreman F. L. Sutherland resigned, effective September 30, to take charge of the International Harvester Company demonstration farm located three miles east of Aberdeen. Mr. Joseph H. Hoffman of Brookings has been secured as his successor.

Highmore Substation, Highmore (E. S. McFadden). No report.

State Experiment Station, Brookings (Manley Champlin). All threshing is complete and the work of seed cleaning, invoicing, etc., is now in progress. Fall plowing will soon be completed. Fall seedings of winter wheat and rye for rotation work and for rate-of-seeding and varietal experiments were made during the first half of the month.

The corn crop of the state is excellent. Wheat is fairly good in the central and western sections and in some localities in the eastern section, but over much of the eastern part of the state the losses from blight, scab, etc., are heavy, there being very little good quality wheat from the 1919 crop. Barley, oats, and rye are fair, while flax is better than normal.

NORTH DAKOTA

State Experiment Station, Agricultural College (Theodore E. Stoa). No report.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). The last half of September has been cold and cloudy but there has been little rain and no frost.

All flax varietal and hybrid nurseries have been harvested except a few late varieties and individuals. These latter may still ripen satisfactorily if not killed by a heavy frost.

Ripening of late flax has been much slower than was anticipated. The June 15 date of seeding plats have not yet been harvested, and the late-sown bulk flax has not been threshed.

A few seeds of fall wheat sown September 13 have germinated, but there was not enough moisture to obtain a stand.

Maximum temperature for the last half of September was 91°, September 17; minimum, 33°, September 25, 28, and 29; precipitation, 0.22 inch. The first frost of the season occurred last night, October 3, with a temperature of 28°.

Mr. W. N. Christopher was here September 29 locating rust on grains and grasses.

Dickinson Substation (Ralph W. Smith). The month of September, although wetter than any during the summer, was comparatively dry, with a total precipitation of 0.70 inch. A part of this was in the form of snow, melting as it fell on September 28. There was no killing frost during the month, although the temperature remained at 32 degrees for a brief time during the snow.

Flax varieties were thrashed last week, completing the thrashing for the season. The fall seeding of wheat and rye was completed last week. Seven varieties of winter wheat were drilled in standing corn, with duplicate plats in corn stubble. Four varieties of rye were sown in duplicate plats in cane stubble. About 600 nursery rows were sown to fall wheat hybrids and varieties. Fall seeding was delayed in the hope that moisture sufficient to insure oxen germination would fall. During previous dry seasons light showers would cause some of the grain to germinate which would die out later for lack of moisture. The snow and rain of September 28 will doubtless bring up a part of the grain.

The following are the yields in bushels per acre of spring and fall wheat obtained at the Dickinson Substation in 1919. The spring wheat yields are from duplicated plats 9 feet by 151.25 feet, except where noted. The fall wheat yields are from duplicated fortieth-acre plats.

Spring Wheat

Variety	C. I. No.	Bu.
Durum Group		
Monad (D-1)	3321	6.4
Acme	5284	6.1
Arnautka	4064	5.2
Mindum	5296	4.6
D-5	3322	4.5
Kubanka No. 8	4063	4.4
K-98	1440-98	4.4
Buford	5295	4.3
Kubanka	1440	3.9
Golden Ball	6227	4.8*
K-58	1440-58	4.5*
Average of durums		4.65
Bluestem Group		
Haynes Bluestem	2874	3.7
Crossbred Bluestem	3314	3.2
Average of group-		3.45

Variety	C.I. No.	Bu.
Fife Group		
Glyndon (Minn.163)	2873	536.
Ruby	6047	5.5**
Power Fife	3697	5.1
Red Fife	3329	4.3
Rysting Fife	3023	3.8
Marquis	3641	3.4
Average of Group-		4.61
Preston and Misc. Groups.		
Kota	5878	6.6**
Pioneer	4324	4.7
Prelude	4323	4.5
Huron	3315	3.6
Preston	3081	2.8
Kubanka x Preston	4789	5.2***
Kubanka x Haynes	4788	4.3***
Average of Group-		4.53

Fall Wheat

Variety	C. I. No.	Yield in bu.
Beloglina	1543	4.4
Kanred	5146	4.2
Turkey (N.D. 1997)	3084	3.7
Buffum No. 17	3330	2.9
Kharkov	1583	2.9
Turkey	1571	2.9
Nebraska Hybrid	5147	0.9
Average,		3.13

* Only one plat 5 feet wide
** Three plats, each 5 feet wide.
*** Only one plat 9 feet wide.

MONTANA

Judith Basin Substation, Moccasin (P. V. Cardon, Supt.). No report.

WESTERN BASIN AND COAST AREAS
(South to North and West)

UTAH

Nephi Substation, Nephi (Aaron F. Bracken). The precipitation since September 15 has amounted to 1.44 inches, making a total of 2.39 inches for the month. Because of the extreme dryness of the soil, rain which fell previous to September 29 was not sufficient to make sowing of fall grains safe. A number of farmers took a chance, however, and seeded after the storm of September 2 and 3. Warm days followed which caused a quick germination of the seed and a rapid evaporation of the moisture. Reseeding of these fields would have been necessary had it not been for the 0.95 inch of rain which fell on September 27. On September 29, seeding began on the station and will be finished within ten days. The soil is now in excellent condition for sowing fall grain.

IDAHO

Aberdeen Substation, Aberdeen (L. C. Aicher). No report.

OREGON

Harney Branch Station, Burns (Obil Shattuck). No report.

Sherman Co. Branch Station, Moro (D. E. Stephens). No report.

WASHINGTON

Adams Branch Station, Lind (M. A. McCall). September has remained dry and there is not enough rain for seeding. The wheat in the first set of plats in the date, rate, and depth of seeding experiments has been sown, but none of it is up. The first tillage operations on the summer fallow experiments are also completed.

A very severe windstorm occurred on the 26th and 27th which caused drift-

ing of the soil on a large acreage in this section. There was soil blowing on several farms in the vicinity of the station, but none on the station farm.

Mr. H. F. Holtz of the Soils Department, Washington State College, with an assistant, is making nitrate and moisture determinations on the tillage plats, both those on which a crop was harvested this year and those now ready for seeding. The results of his work will be reported later.

Recent visitors to the station include C. W. Warburton of the Office of Cereal Investigations and R. A. Oakley of the Office of Forage Crop Investigations.

The yields of spring crops on field plats are as follows:

Spring Wheat

Variety	C. I. No.	Acre Yield in Bu.	Bushel weight, lbs.
Early Baart	1697	14.1	57.25
Chul x Bluestem	6180	13.8	54.75
Talimka	2495	13.2	57.75
Bluestem	4067	12.8	52.50
Federation	4734	12.5	54.00
Fretes	1596	12.4	55.33
Bobs	2826-1	12.3	58.50
Hard Federation	4733	12.3	59.00
Bluestem x Chul	6181	12.1	53.00
Kustem	6179	12.0	52.00
Chul	2227	11.8	57.20
Marquis	3641	11.7	55.20
Koola	2203-2	11.4	59.25
Oudebaard	6228	10.9	55.75
Red Allen	5407	10.9	52.50
Dicklow	3663	10.7	48.75
Karun	2200-1	10.5	61.00
D-5	3322	9.8	58.30
Hybrid 143	4513	9.7	53.30
Huron	4935	9.4	50.75
Power	3697	9.3	53.50
Little Club	4066	9.3	49.30
Pioneer	4324	9.2	54.70
Preston	3081	8.8	55.00
Pelissier	1584	8.4	56.50
Kubanka	1440	8.2	56.80
Golden Ball	6227	6.7	56.75
Prelude	4323	5.2	58.00

Spring Rye

S.P.I. 26102	108	11.3	52.70
Spring Rye	201	10.2	54.00
Abruzzes Spring Rye	40	9.9	53.50
	203	8.5	53.00

Spring Barley

Variety	C. I. No.	Acre Yield in Bu.	Bushel weight, lbs.
Success		20.1	41.50
California	1279	18.6	42.00
Meloy	1176	17.9	41.00
Trebi	936	17.1	39.00
Blue	1277	16.7	39.00
Hannchen	531	15.6	47.00
White Smyrna	901	15.0	45.00
Himalaya	620	10.7	58.00

Spring Oats

Richland	787	23.0	30.8
Rustless	724	22.3	27.3
Kherson		21.3	30.3
Kherson	459	21.2	30.2
Sixty Day	626	18.6	27.3
Sixty Day	165	18.5	29.2
Swedish Select		17.4	30.5

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones). Rice is ripening very fast. The fertilizer, cultural, and irrigation experiments are being drained. In the varietal work some plats of early rice have been drained since September 15, but due to rain and poor drainage no harvesting has been done. About 100 early varieties and selections have been harvested in the nursery.

On commercial fields some harvesting has been done of Sue Hero and No. 1600.

Maximum temperature for the period, 98° on September 21; minimum, 47° on September 30; precipitation for September, 1.23 inches. Weather at present is unsettled with rain last night (Sept. 30).

Plant Introduction Station, Chico (V. H. Florell). The season has been almost ideal for the harvesting and drying of prunes and peaches, but there has not been sufficient precipitation to begin plowing in preparation for fall-sown grain. Precipitation during the month: 0.70 inch on September 7; 0.10 inch on September 29; 0.05 inch on September 30.

The nursery grains are being weighed out in preparation for fall sowing, which it is anticipated will be during the first week in November.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

- -

Vol. 11. October 20, 1919. No. 20.
Personnel (Oct. 11-20) and Station (Oct. 1-15) Issue.

PERSONNEL ITEMS

Frederick L. Blaine, who has been connected with the smut control campaign and cereal disease field survey during the past year, left Washington on October 14, to resume his study of landscape designing at Harvard University.

R. A. Carroll returned to Washington, Monday, October 20, from Jackson County, Georgia, where he has been assisting the farmers to eradicate the nematode disease of wheat. The fifteen farmers having the disease on their places signed a pledge to sow wheat free of the nematode on soil not sown in wheat for three years. Cooperation from millers and threshermen also was assured. Jackson County is the only county in Georgia where the nematode disease has been found. Mr. Carroll leaves Tuesday for Virginia to make a survey for the nematode disease in that State.

John H. Christ, who was engaged on cereal disease survey, with special reference to cereal smuts, in Idaho during the summer, is located at the Beta Theta Pi House, Iowa State College, Ames, Iowa, where he is taking a post-graduate course.

William V. Cutler, who has been engaged in the barberry eradication campaign in Ohio during the past few weeks, has completed his work and returned to Washington on September 20.

Jesse M. Dunn, who has been helping Dr. Hoffer in the investigation of corn rots at Indiana Experiment Station, resigned on September 30 to resume his studies at Purdue University.

Prof. J. W. Hotson of the Department of Botany, University of Washington, Seattle, who was engaged during the late summer on smut survey in Washington, returned to his duties at the University at the opening of the fall term.

Dr. G. H. Jensen of Washington State College, who was engaged during the late summer in supervising the smut spore collectors attached to grain separators in Washington and Idaho, returned to his duties at the State College at the end of September.

Herdis L. Lewis, who was on cereal disease survey during the summer, and more recently has been engaged on barberry eradication in Ohio, has been trans-

ferred to the nematode survey, and arrived in Washington on October 10, for assignment to work in West Virginia.

Mr. James E. Norton, who has been assisting Mr. Stephens in keeping the experimental records at the Sherman County Branch Station, Moro, Oregon, completed his work and resigned on October 15.

Prof. W. W. Robbins, Botanist of the Colorado Agricultural College, and State Leader of the barberry eradication campaign in that State, has resigned his college position to accept service in the experimental department of the Great Western Sugar Company with headquarters at Longmont, Colorado, effective October 20.

Lloyd E. Thatcher, who has been engaged on barberry eradication in Nebraska, resigned on October 16, to accept a position as instructor in zoology at the University of Michigan.

Ivan A. White, who has been under appointment since March 1 to assist Prof. Melchers in laboratory and greenhouse studies of stem rust, resigned on October 15 to continue his studies at the Kansas Agricultural College.

Wilbur W. Wood, who was on cereal disease survey during the summer, and more recently has been engaged on barberry eradication in Ohio, has been transferred to the nematode survey, and arrived in Washington on October 10 for assignment to work in West Virginia.

Hill Williams, who was engaged on smut survey and control in Washington during the summer, resigned effective September 15 to take up graduate study at Harvard University.

AMENDMENTS TO THE PROPERTY REGULATIONS, MEMORANDUM NO. 293,

October 1, 1919.

Effective October 1, 1919, Paragraphs 7 and 8 of the Property Regulations of this Department are hereby amended to read as follows:

7. INDIVIDUAL ACCOUNTABILITY.- Each employee intrusted with any nonexpendable property shall be required to receipt and, from time to time, account therefor. An employee intrusted with any expendable property shall likewise be required to receipt therefor and, when the chief of the bureau shall so direct, account therefor from time to time. Having receipted for an article an employee may be relieved of responsibility ---(1) by delivery of the article to the bureau property clerk and taking a receipt therefor; (2) when authorized by the chief of the bureau, by delivery of the article to another employee of the bureau and taking his receipt therefor; (3) by presenting a certificate approved by the chief of the bureau, or by an employee authorized by the chief of the bureau to approve such certificates, that the article has been consumed in use, lost, stolen, damaged, or destroyed; (4) by payment to the disbursing clerk or appropriate fiscal agent of the value of the article at that

time as determined by the chief of the bureau or other employee designated by him; (5) by sale or other disposition by a board of survey (see paragraph 9 of these regulations); or (6) by abandonment (see paragraph 12 of these regulations).

8. PROPERTY LOST, STOLEN, DAMAGED, OR DESTROYED.- Whenever any property either expendable or nonexpendable is lost, stolen, damaged, or destroyed, the employee who has custody of the property at the time will forward to the chief of bureau, through the employee against whom the property is charged on the property records, a certificate showing (1) a list of the articles, (2) the circumstances attending their loss, damage, or destruction, (3) whether his fault or neglect or that of any employee was envolved, and (4) if the property was lost or stolen, the action taken to recover the property. When the value of the property exceeds $10 the certificate shall be sworn to before an officer authorized to administer oaths of office (see Administrative Regulations) or before any of the officers required, empowered, and authorized by law to administer oaths to accounts for travel or other expenses against the United States (see Fiscal Regulations). All such oaths must be taken without expense to the Government.

If the certificate upon examination is found to be satisfactory, the chief of bureau will authorize the dropping of the property from the property records; otherwise, he will take steps to recover the value of the property from the employee responsible, and promptly transmit any moneys which may be collected to the disbursing clerk or appropriate fiscal agent for deposit in the Treasury. If the amount of the loss is considerable, and it appears that the property may have been lost, stolen, damaged, or destroyed through the fault, neglect, or misconduct of an employee, a board of survey may be appointed by the Secretary, upon recommendation of the chief of bureau, to determine the responsibility, and make recommendation to the Secretary as to what action should be taken by the department in the matter.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). No report.

GEORGIA

State Experiment Station, Athens, and Substations (R. R. Childs). No report.

TENNESSEE

State Experiment Station, Knoxville, and Substation, Jackson. (C. A. Mooers). No report.

NORTH CAROLINA

State Experiment Station, West Raleigh, and Substations (G. M. Garren). No report.

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor). The sowing of barley in field plats has been completed, and most of the wheat in plats and nursery rows has been sown. Surplus oat, barley, and wheat from the varietal plats have been weighed and stored.

Maximum temperature for the week ending October 5, 93 degrees; minimum, 56 degrees; precipitation, 1.06 inches. For the week ending October 12, maximum temperature, 92 degrees; minimum, 50 degrees; precipitation, 0.05 inch.

NEW YORK.

Agricultural Experiment Station, Ithaca (H. H. Love). Weather conditions have been such that the fall-sown grains are making a very good growth. Both the nursery series and plat series of wheat and rye are showing up very well. During the first week of the month W. T. Craig and H. H. Love sowed cooperative rye-breeding plats in the eastern part of the State. Notes are now being taken on the hybrids and seed is being prepared for the material to be grown at Chico. Seed has just been sown in the greenhouse by Prof. C. F. Noll of the Pennsylvania State College, for "the study of inheritance of earliness and related characters in oats." Prof. Noll is spending a year here in graduate work.

ILLINOIS

Cooperative Corn Rot Investigations, Bloomington (J. R. Holbert). No report.

MISSOURI

State Experiment Station, Columbia (L. J. Stadler). No report.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett). No report.

GREAT PLAINS AREA (South to North).

TEXAS

Amarillo Cereal Field Station, Amarillo (John F. Ross). No report.

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). Thus far in October several showers have fallen, totaling 1.74 inches. These rains have put the soil in good condition for fall sowing. Wheat on the station will be sown as soon as the soil is dry enough to work.

All of the grain sorghums on the station are in the shock and practically all of the broomcorn is harvested. A few of the later sorgos are still uncut.

Over the county sorghums are making a fair or better than average yield. The wheat acreage will probably be about one-half of that sown in the fall of 1918.

The maximum temperature for this month to date was 92 degrees on October 2, and the minimum was 32 degrees on October 11. The precipitation of 1.74 inches was distributed as follows: October 4, 0.37 inch; October 5, 0.05 inch; October 6, 0.08 inch; October 8, 0.83 inch; October 9, 0.05 inch; October 10, 0.02 inch; and October 15, 0.34 inch.

KANSAS

Fort Hays Branch Station, Hays (A. F. Swanson). Cooler weather prevailed during the first fifteen days of October. The rainfall was 2.25 inches and as a result field work has been somewhat limited. All wheat which has been seeded has made a good start. The seeding of wheat in this vicinity is nearing completion. Stakes are now being prepared for marking each plat of small grain on the cereal project. As the weather permits, counts of stands are being made and other data accumulated.

State Experiment Station, Manhattan (John H. Parker). No report.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). Seeding of winter grain in this section of Colorado is near completion. Practically all wheat will be sown by October 15. In many fields the stands are very heavy.

The cereal nursery seedings were completed October 7. The fall-sown nursery this year covers nearly an acre of ground and contains about 1,325 rows. The fourth seeding in the combination, rate and date experiment was made October 1. The three previous seedings in this experiment have emerged to satisfactory stands. Counts of the stands in the varietal and the first three seedings of the combination experiment have been made.

Weather conditions are very favorable for fall grain, a rain of 1.12 inches having fallen on October 8. The first frost of the season at Akron Field Station was recorded October 5. Most of the row crops had been cut and little damage resulted.

On October 8, Mr. Coffman left Akron for Amarillo, Texas, to assist in thrashing grain sorghums and other crops at the Amarillo Cereal Field Station. In the Brush and Ft. Morgan irrigated section of Colorado the sugar beet harvest was well under way. The crop of beets seems fair this year, in spite of the shortage of water for irrigation. The trip from Denver, Colo., to Dalhart, Texas, was made over the Colorado and Southern. The crops along this road are the best that have been grown for four years. The most important crops in this section are corn and the sorghums. Harvest of corn was completed, while about half of the sorghum still remained standing. It appears that thruout the entire strip of country traversed by this railroad, between Denver, Colo. and Ft. Worth, Texas, there is a severe shortage of labor.

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson). So far the month has been quite cool. The lowest temperature, 18 degrees, occurred on the 10th, and all the nights except five have reached the freezing point or below. The days have also been relatively cool. The maximum, 77 degrees, occurred on the 1st, and the minimum day temperature, 32 degrees, occurred on the 10th.

There has been 0.80 inch of precipitation, mostly in the form of snow. The wind velocity has been low.

Weather conditions have checked the growth of winter wheat. The seeding of October 1st is just germinating and the growth of the earlier seedings is not nearly equal to that in 1918. All corn has been cut and shocked and potatoes have been dug. The plowing of the general field has been completed and improvements on buildings are in progress. The scarcity of labor is delaying these operations.

Sheridan Field Station, Sheridan (Leroy D. Willey). No report.

SOUTH DAKOTA

Bellefourche Experiment Farm, Newell (A. D. Ellison). Maximum temperature for the first half of October was 76 degrees on the 8th; minimum, 12 degrees on the 9th; precipitation, 1.10 inches.

As a result of the recent rains fall wheat sown on dry land has begun to emerge. Fall wheat sown on irrigated land is making good growth. The soil is in good tilth for the germination and growth of fall-sown crops.

Cottonwood Substation, Cottonwood (Manley Champlin). No report.

Vivian Substation, Vivian (Manley Champlin). No report.

Eureka Substation, Eureka (Manley Champlin).. No report.

Highmore Substation, Highmore (E. S. McFadden). No report.

State Experiment Station, Brookings (Manley Champlin). No report.

NORTH DAKOTA

State Experiment Station, Agricultural College (Theodore E. Stoa). No report.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). The first half of October was generally cold and cloudy with occasional snow flurries. The first frost of the season occurred October 3, with a temperature of 28 degrees. A temperature of 6 degrees recorded October 10 killed all late flax which had not yet ripened satisfactorily. All of the flax has since been harvested. Most of the flax nursery has been thrashed, as have some of the hybrids, though a considerable part of the latter still remain to be thrashed.

Maximum temperature for the period was 82 degrees, recorded October 9; minimum, 6 degrees, recorded October 10; precipitation, 0.10 inch.

Dickinson Substation (Ralph W. Smith). The weather has been quite changeable during the first half of this month, with very little moisture and that mostly in the form of snow. There have been three light falls of snow, totaling about 0.14 inch of moisture. A light snow fell this morning, but it will probably soon melt away. The first killing frost of the season was on October 4, with a minimum temperature of 24 degrees. On October 10 the temp-

erature fell to 2 degrees below zero, but the weather soon moderated again. The maximum temperature for the day preceding this cold snap was 79 degrees.

The work of cleaning and weighing the cereal varieties from the plats having been completed, those from the nursery are now being weighed and stored. The yields of oats, barley, and flax varieties grown in replicated plats are very light this year, the yields of oats, barley, and wheat being the lowest ever obtained at this station.

The average yields for the different groups are as follows:

Oats	Bu. per acre
Early	6.7
Midseason white	4.8
Midseason yellow	4.1
Late	5.1
Barley	
2-rowed hulled	2.2
6-rowed hulled	4.3
Nepal	0.2
Horsford	1.5
Average of flax varieties	2.5

Very little fall plowing or seeding has been done in this locality, due to the extremely dry condition of the ground. The fall-sown grain has not yet germinated except in a few spots where the snow supplied sufficient moisture. Grasshoppers are comparatively few in number this fall, and it is hoped that they will not do serious damage here next year.

MONTANA

Judith Basin Substation, Moccasin (P. V. Cardon, Supt.). Fall wheat was not sown as early as usual in this vicinity this year, due to the dry summer and fall. Considerable wheat that was intended to be sown has not been sown yet. Wheat seeding on the station was completed October 7. Kharkov selection, C. I. No. 1585-30, shows the most growth and vigor of any variety that has emerged, and Kanred, C. I. No. 5146, the least.

So far this month, 0.67 inch of precipitation has fallen, all in the form of snow. The resultant cool weather has held back the growth of wheat.

Mr. P. W. Bastine, of the Northern Great Plains Field Station, Mandan, N. Dak., spent a day here recently looking over the shelterbelt work.

WESTERN BASIN AND COAST AREAS
(South to North and West)

UTAH

Nephi Substation, Nephi (Aaron F. Bracken). Since October 1, 1.01 inches of precipitation have fallen in two storms. Each rain has been followed by considerable cloudy weather. This has delayed seeding on the station, but at this time all experimental plats are sown except those in the rate-of-seeding experiments with wheat and winter barley, and the winter wheat in the rotations. Wheat seeded before October 5 is now emerging with good stands.

The unusual amount of precipitation during September, followed by 0.74 inch on October 2, has given farmers of this section hope of having normal yields next season.

IDAHO

Aberdeen Substation, Aberdeen (L. C. Aicher). No report.

OREGON

Harney Branch Station, Burns (Obil Shattuck). No report.

Sherman Co. Branch Station, Moro (D. E. Stephens). No report.

WASHINGTON

Adams Branch Station, Lind (M. A. McCall). No report.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones). No report.

Plant Introduction Station, Chico (V. H. Florell). The first sowings of the barley varieties in Doctor Harlan's experiment on effect of temperature on heading was made October 15. The sowings are on fallowed land, but there is little likelihood that the seed will germinate until there is more rain. Sowings of two varieties of wheat, one of barley, two of oats, and one of flax in triplicate rod rows will be made in conjunction with Doctor Harlan's experiment.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION).

- -

Vol. 11. October 31, 1919. No. 21.
Personnel and Project Issue.

- -

PERSONNEL ITEMS

Victor E. Basart, who was engaged in the barberry eradication campaign in South Dakota during the summer, is now at the Iowa Agricultural College, Ames, Iowa.

Mrs. E. G. Berglund has been given temporary appointment effective October 23 to assist Mr. Clark in compiling records of distribution of commercial wheat varieties.

Miss Nellie J. Briggs, who has been assisting Mr. Holbert with the germination of corn and other experiments at Bloomington, Ill., during the summer, resigned effective September 23.

George J. Burt, scientific assistant in corn investigations, resigned effective October 31, to accept the position of manager of a large farm in Illinois.

F. A. Coffman, in charge of the experiments of this Office at the Akron Field Station, Akron, Colo., went to the Amarillo Cereal Field Station, Amarillo, Texas, on October 6 to help with the completion of experiments at that station.

William V. Cutler, of whom it was stated in the last issue of the Courier that he returned to Washington on September 20, actually returned on October 20, completed his report, and resigned effective October 22.

L. W. Durrell, who has been a collaborator in crown rust investigations at the Iowa Experiment Station, has been appointed as agent effective October 16 and assigned to the investigation of anthracnose of cereals.

Raymond Fogelman, who has been assisting Dr. Stakman in the investigation of the biologic forms of stem rust at the Minnesota Experiment Station, resigned effective October 31 to commence post-graduate study on imperfect fungi at the University of Minnesota.

George H. Gillespie completed his survey of the distribution of nematodes in Virginia on October 31. He will now assist Mr. Leukel with plat experiments on nematode control at Arlington Farm for a few days.

C. P. Hartley, Physiologist in Charge of Corn Investigations, returned on October 25 from supervising the completion of experiments for this season at Piketon, Ohio.

Eugene D. Holden, who has been under part-time appointment for the investigation of wheat scab and related diseases at the Wisconsin Experiment Station, resigned effective September 30 to give full time to his university duties.

Dr. A. G. Johnson, who has spent the last week in Washington for conference and the planning of future investigations, left Washington on October 31 enroute to Madison.

Dr. F. E. Kempton returned to the Office on October 28 after a 3 weeks trip through the States of the Great Lakes and Ohio Valley to confer with state leaders and assistant state leaders regarding the progress and the results of the barberry eradication campaign.

George F. Miller, who recently has been working in the vicinity of Ashland, Virginia, on the nematode survey, was in Washington on October 23 for conference. He has been assigned to continue the survey in the vicinity of Staunton, and left for that point on October 24.

Creighton F. Murphy, assistant to Mr. Krakover in overwintering studies of stem rust in the northeast district, was at the office on October 22 while enroute to his station in Maryland.

Miss Florence M. Smith, who has been engaged during the summer in analysis and identification of samples of smuts and other cereal diseases collected by field men, has been detailed, effective October 16, to assist Dr. H. S. Jackson in the investigation of leaf rusts of cereals.

Kercheval E. Smith completed his nematode survey in Virginia and returned to his home in Washington, D. C., on October 21.

George W. Spinning, who has been employed in barberry eradication in Michigan during the summer, has completed the work for this season and resigned effective October 6.

Dr. E. C. Stakman spent the last half of October studying the distribution of barberries in the three prairie provinces of Canada and tracing the relationship of rusted barberries to grain rust. He returned to University Farm, St. Paul, at the end of the month.

VISITORS

Dr. C. A. Zavitz, Agronomist af the Ontario Agricultural College and Experiment Station at Guelph, was a visitor on October 31.

FINANCIAL MATTERS

ATTENTION OF ALL EMPLOYEES HAVING LETTERS OF AUTHORIZATION.

1. Prompt Sending of Monthly Expense Accounts and Other Vouchers.

It is necessary that the Office be able to draw a complete financial statement at regular intervals. Every employee who is authorized to incur expenses is requested to submit expense accounts promptly at the end of each month. These accounts should include all expenditures to and including the last day of the month.

Those employees who are authorized to incur field and station expenses or to employ temporary assistants, should see that any Form 5 vouchers for supplies and material and any Form 3 vouchers for salaries of assistants are submitted to the Office promptly at the end of each month. Form 5 vouchers must be used only in accordance with the recent regulations on purchasing supplies and printing in the field. The delay in submitting vouchers for expenses incurred has proved very embarrassing to the Office in attempting to keep track of its obligations and expenditures.

2. Prompt Sending of Coupons of Transportation Requests.

The coupons of transportation requests are to be filled completely by the traveling employee and mailed at once to the Office of Cereal Investigations as soon as the request has been used. Employees must not hold back these coupons to send with their expense accounts, and they must not send them direct to the Office of Records. The coupons must be sent promptly because the transportation companies to whom the requests are issued often submit their bills very promptly. Unless the coupons are sent direct to this Office, we have no way of knowing what liabilities have been incurred

and no way of checking the accuracy of the expense record when it arrives at the end of the month. All reimbursement accounts are held up if the transportation request coupons have not been received here before the accounts arrive. Many of the employees have their accounts greatly delayed by neglecting to send their transportation coupons promptly.

Many employees leave unfilled part of the blanks on transportation request coupons. The omissions most frequently made are the name of the state, the kind of transportation purchased (whether railroad tickets, scrip, upper or lower Pullman berth or Pullman seat), and the charge made by the company for the transportation purchased. Especially common is the omission of statement as to whether a Pullman berth is upper or lower and the amount charged for the transportation. All this information is absolutely necessary both for our fiscal records and to enable the Auditors of the Bureau to audit the accounts of the traveler and the bills submitted by the transportation companies. The omission of this information from the coupons not only requires a great deal of time and labor in correspondence but delays the handling of the expense accounts in many instances.

3. Estimates of Future Expenditures Necessary.

In nearly all the projects of this Office expenditures have been unusually heavy during the months of July to October inclusive. Reduction of expenditures to low limits for the remainder of the fiscal year is necessary. Each officer in charge of the investigations at field stations or cooperative State experiment stations is requested to submit an estimate of necessary expenditures from November 1, 1919, to June 30, 1920, in order that needs may be canvassed and funds allotted so far as funds are available. Such estimates should be mailed in time to reach the Office not later than November 30. Please don't forget that all expense vouchers for October must be sent in at once if not already done.

218-A. INVESTIGATIONS OF IMPERFECT AND SAC FUNGI.
(Dr. A. G. Johnson, Pathologist in Charge.)

CORN ROT INVESTIGATIONS.
Dr. George N. Hoffer, Pathologist in Charge.

These investigations are conducted cooperatively with the Indiana Experiment Station at LaFayette, Experiments are conducted at several points in Indiana and in several other States.

Indiana Experiments on Dent Corns.
(Mr. J. F. Trost and Mr. B. H. Duddleston).

The experimental plots of dent corn are located at Valparaiso, Grabill, Battle Ground, Ft. Branch, Cass, LaFontaine, Forest, Shelbyville, and Rensselaer. They have all been harvested and the final pathological and yield data have been taken. Samples for moisture loss determination have been taken from all of the plots, and as soon as this is determined, the final performance records will be tabulated.

The cooperating parties in this work are as follows:

J. A. McCarty,	Ft. Branch, Ind.,	Reid's Yellow Dent.
Ozra Pigg,	Cass, Ind.,	" " "
C. E. Troyer,	LaFontaine, Ind.,	" " "
Wm. B. Kramer,	Forest, Ind.,	" " "
P. J. Lux,	Shelbyville, Ind.,	Johnson County White.
C. Gangloff,	Renssalaer, Ind.,	Silvermine.
W. Scoville,	Valparaiso, Ind.,	Cook's 90 Day.
T. D. Conrad,	Grabill, Ind.,	Early Yellow Dent.
I. M. McCollough,	Battle Ground, Ind.,	" " "

Experiments on Sweet Corns.
(Glenn M. Smith).

These plots are located at Marshalltown and Sioux City, Iowa; LaGrange, Illinois; Frankfort and Shelbyville, Indiana; Rochester and Grass Lake, Michigan; and DeGraff and Chillicothe, Ohio. These plots have all been harvested and moisture samples taken.

The cooperating agencies are as follows:

Western Grocer Mills,	Marshalltown, Iowa.	Stowell's Evergreen.
Sioux City Seed Co.,	Sioux City, Iowa.	" "
DeGraff Canning Co.,	DeGraff, Ohio.	" "
C. S. Clark,	Wakeman, Ohio.	" "
Sears & Nichol Co.,	Chillicothe, Ohio.	" "
Fame Canning Co.,	Franklin, Indiana.	" "
Fame Canning Co.,	Shelbyville, "	Country Gentleman.
Ladoga Canning Co.,	Ladoga, Indiana.	Stowell's.

D. M. Berry Seed Co.,	Rochester, Michigan.	S. E. & C. G.
E. B. Clark Seed Co.,	Milford, Conn.	Stowell's Evergreen.
" " " " "	" "	Early Evergreen.
" " " " "	" "	Country Gentleman.
" " " " "	" "	Crosby.
Leonard Seed Co.,	Chicago, Illinois.	Stowell's Evergreen.
Jerome B. Rice,	Grass Lake, Michigan.	Country Gentleman.

Experiments in the Eastern States.
(Ira C. Hoffman).

These plots are located at Milford, Connecticut; Amherst, Massachusetts; New Brunswick, New Jersey; Hershey, Pennsylvania; State College, Pennsylvania; and Arlington Farm, Virginia. The harvesting of these plots is being completed at the present time.

At all of these places field selections of seed ears are being made and plans formulated for next year's work. The work will consist primarily of the study of local problems, using the ear-to-row experiments for this purpose. Bulk plantings will also be made for experimental work.

The cooperators in the Eastern States are:

E. B. Clark Seed Co.,	Milford, Connecticut.	S. E. & C. G.
Dr. Vincent Osmun,	Botanical Dept., Amherst, Massachusetts.	90-Day Yellow Dent.
C. R. Orton,	State College, Pa.	Yellow Dent.
E. C. Butterfield,	Arlington, Virginia.	Mixed Varieties.
Mel. T. Cook,	New Brunswick, N. J.	Leaming.

I218-B. INVESTIGATIONS OF RUSTS.
(Dr. H. B. Humphrey, Pathologist, in Charge.)

BLACK STEM RUST INVESTIGATIONS.

Biologic Specialization. (E. C. Stakman).

The work on biologic specialization is divided into three sub-projects: 1. The determination of the identity of new forms. 2. The determination of the reaction of varieties to known forms. 3. Studies on the origin and nature of biologic forms.

The Determination of New Forms. The immediate supervision of this work is by M. N. Levine. During October thirteen new stem rust specimens from nine states in the Union, two provinces in Canada, and one department in France were received and cultured. Seven of the specimens proved to be some form of Puccinia graminis tritici, one P. g. secalis, one P. g. avenae and one P. g. phleipratensis. The others have not yet been definitely determined.

During the month thirty-three so-called strains obtained from various parts of the country were classified into twelve different biologic forms. Two of these forms were entirely new and the prospects are that another one is different from any which has previously been cultured. It is interesting to notice that some of the strains are widely distributed while others are apparently confined to rather restricted areas. All of the biologic forms, except of course the new ones, behaved exactly the same as the same strains which were obtained last year. This indicates clearly that these biologic forms within wheat varieties are fairly constant and quite definitely fixed.

The weather conditions during the month were unfavorable for cultural work in the greenhouse. There was little sunshine and the weather was rather cold and humid. However, fair progress was made.

Reaction of cereal varieties to known forms of rust. H. D. Barker is in immediate charge of this work. During the month particular effort was made to purify all strains. Some of them had become slightly mixed on account of the crowding of plants in the greenhouse during the rush season in the summer. It is of course of the utmost importance that these strains be absolutely pure before varietal testing begins. All of the known strains which attack wheat have now been purified and the work of testing wheat varieties will begin soon. Recently-isolated strains of some of the biologic forms have been substituted for those which have been cultured in the greenhouse for a long time. This is done in order to insure vigor of the strain.

Origin and Nature of Biologic Forms. Mr. Barker reports that he has now made single-spore isolations of five known biologic forms of P. graminis on wheat. It is quite important that we ascertain exactly the degree of stability of these biologic forms and also get whatever information we can as to their possible origin. The importance of this is quite obvious when we consider the possibility that these forms may still be changing and that new forms may be originating at the present time. Naturally single-spore isolations will produce cultures which can be relied upon. These cultures are kept isolated in such a manner as to preclude the possibility of accidental in-

fection by wind-blown spores. Everything is now ready to start promptly the determination of the degree of plasticity of these forms.

The Nature of Resistance. (E. C. Stakman).

Mr. Freeman Weiss has begun an extensive investigation of the sequence of events when barberries immune to P. graminis are inoculated with viable teliospores. He has killed, fixed, and imbedded a great deal of material and has prepared about sixty slides which are now being studied.

An extensive experiment to test the effect of stem rust and leaf rust on the transpiration of wheat under systems of nutrition; and the effect of different systems of nutrition on the development of rust and consequent injury to the host is fully outlined and the necessary material is being prepared. It is planned to control all factors so that specific differences in nutrition can be correlated with the differences in the behavior of both the rust and the host plants. One hundred and twenty potometers have been prepared and the plants will be started soon.

Epidemiology Studies. (E. C. Stakman).

During the month of October most of the work has consisted of a completion of overwintering stations and the establishment of new stations. Two types of stations are being established: (1) stations at which germination tests will be made, and (2) a larger number of observational stations. A brief report by districts is given.

Northeastern District. L. J. Krakover and C. F. Murphy report as follows: Mr. Krakover spent most of his time in traveling through Ohio, Virginia, and West Virginia, where he made observations on the distribution of Berberis canadensis and made extensive observations on the rust conditions especially in those regions in which epidemics occurred during the summer. Mr. Krakover also finished establishing stations. Those in Ohio will be turned over to Mr. Rose, while those in Virginia and West Virginia will be handled by Messrs Krakover and Murphy. Mr. Murphy spent most of his time in Pennsylvania and Maryland after having finished his work in Western New England.

Forty one stations have now been established in the district. Of these nineteen are germination stations and barberries occur at thirty two.

Some excellent rust material was found in western New England in addition to that previously reported from New York. It was very striking that so little rust occurred in some of the districts in Pennsylvania, Virginia and West Virginia, where such heavy rust attacks occurred during the past summer. In view of the fact that most of the local epidemics were clearly due to infected barberries the presumption is that the barberries will again be responsible for initiating most of the rust attacks in the spring. It is obviously quite unlikely that much overwintering will occur when there is so little urediniospore material in the fall. However, too much stress probably should not be placed on this fact as a rather severe drought of prolonged duration prevailed until about the middle of October.

North Central East District. Mr. Rose and Mr. Cheney conferred at East Lansing and have arranged the work in the district. Excellent progress has been made. Mr. Rose visited the stations previously established by Mr. Fogelman in Michigan and found them in excellent condition. Artificial inoculation of winter wheat was resorted to at several stations and the inoculations were quite successful. Mr. Rose also traveled through Ohio and Kentucky where he got acquainted with stations previously established by Mr. Krakover and where he also selected other stations. Mr. Cheney finished establishing stations in Indiana and Illinois, then proceeded to the upper peninsula of Michigan and on through Wisconsin. At Madison he conferred with Dr. E. M. Gilbert in regard to the most desirable locations for stations, and Mr. Cheney is now engaged in establishing twelve or fifteen stations at various points in Wisconsin.

A complete record of the stations established in the entire district is not yet at hand. However, thirty-two have been established in Indiana and twenty in Illinois. It is quite essential that a large number be established in those states since there has been some evidence that new rust attacks in the spring may originate from overwintered urediniospores. A selected number of the stations will be used for germination tests, while the others will constitute the observational stations.

North Central-West District. Mr. Thiel and Mr. Christopher have almost finished establishing stations. During the month Mr. Thiel has made observations in Minnesota while Mr. Christopher is still on an extensive trip through Montana, Wyoming, Colorado, Nebraska and South Dakota. Mr. Christopher is making final observations on the condition of the rust at different localities in the above-mentioned States. Spores are also being collected for germination tests.

Sixty-nine stations will be used in this district. Of these twelve will be in Minnesota, eight in North Dakota, five in Montana, seven in Wyoming, five in Colorado, ten in Nebraska, nine in South Dakota, and thirteen in Iowa. Nearly all of these have been completely established and visited. A few remain yet to be completed. Thirty-one will be used as germination stations.

The first set of germination tests has been made in all of the States in this district except North Dakota. Five biologic forms have been used in germination tests, viz: P. gr. tritici, P. gr. avenae, P. gr. secalis, P. gr. phleipratensis, and P. gr. agrostis. The average percentage of germination for each biologic form in the order given above is as follows: 50, 40, 26, 29, and 53. These averages are only preliminary since not all of the stations are included for each biologic form. It is clear, however, that the urediniospores of the wheat form are germinating more readily than those of the form on oats. The other figures are not yet conclusive.

Northwest District. Mr. Hoerner and Mr. Dietsch have both traveled fairly extensively during October. New stations for rust observations were established at Medford and Riddle, Oregon. Species of wild Oregon grape (used in the loose sense) have been collected at these two places. Further collections and observations were also made in the vicinity of Coquille, Eugene and Albany, Oregon.

A conference was held with Mr. Thurston at Sacramento regarding the exact division of stations where the northwestern and southwestern districts meet. Both Mr. Hoerner and Mr. Dietsch attended the conference. Mr. Dietsch continued east while Mr. Hoerner returned to Oregon.

Work on the garden for Mahonia and barberry at Corvallis is progressing satisfactorily. Several hundred plants of different varieties are now in first class condition.

Southwestern District. Mr. Thurston has been getting acquainted with his territory. On account of the fact that the epidemiology studies were not carried on in the southwest previous to this fall, Mr. Thurston is required to do pioneer work although Prof. Mackie has been able to offer valuable suggestions for the work in California.

Plenty of telial material has been found on the stubble and grass straw in various parts of Arizona. So far, however, uredinial material has been found only at Prescott. On account of dry weather volunteer grains are scarce. For this reason it will be extremely interesting to follow the course of development of rust on winter-sown grains and to get data on the possible origin of the initial infections.

Six stations have been established in Arizona and stations are now being established in California, Nevada and Utah. Some interesting developments are likely to materialize within a couple of months.

South Central District. Mr. Kirby has established himself at headquarters in the department of botany of the University of Oklahoma, at Norman. Since his arrival it has rained almost continuously, thus preventing estensive field work. Germination tests will be begun this month at practically all of the stations.

Southeastern District. Mr. Ludwig has been looking almost in vain for uredinial material of rust in Alabama, Louisiana, Mississippi and Tennessee. It has been very rainy and practically no small grain is sown south of Tennessee. Rust on volunteer grains, where such occur, is practically absent. However, leaf rust has been found at Nashville and stemrust has been found at the same place on Red Top. Artificial inoculation is being resorted to at some of the stations. Quite likely stemrust will appear on some of the fall-sown wheat after it has developed into the mat stage. The fact that there is so little stem rust in the South in the fall and that it reappears at many places in the spring has been noted in previous years. One of the puzzles in the epidemiology work has been to determine where the rust overwinters in the South.

STEM RUST IN THE PRAIRIE PROVINCES OF CANADA.

Notes by E. C. Stakman, October 17 to October 29, 1919.

Places Visited. Winnipeg and Nespawa, Manitoba; Prince Albert and Saskatoon, Sask.; Edmonton and Calgary, Alta. These places were used as centers from which walking trips ranging from five to ten miles were made.

Conferences. Conferences were held with Prof. Buller and Prof. Roberts at the University of Manitoba (Prof. Jackson on vacation); with Prof. W. P. Thompson and Prof. Frazer at the University of Saskatchewan, and with Prof. Lewis at the University of Alberta.

The following suggestions came from these conferences. 1. Prof. Roberts expressed a desire that we try the effect of various biologic forms on a wheat-rye hybrid which he has. The idea struck me as being very good. 2. Prof. Thompson, who is engaged in extensive work in breeding wheats for early maturity and rust resistance, also suggested that we test some of his wheat varieties for him. This also seemed to me obviously desirable. I also offered to send him some of our rust strains in order that he might try their effect on some of his hybrids of which he had only a limited amount of seed. 3. Prof. Frazer expressed the desire for closer cooperation on rust epidemiology studies. I offered to keep him in touch with our results in the States and he in turn offered to send us the salient facts uncovered in Canada. It seemed especially desirable that we keep in close touch in the spring in order that definite information may be obtained of the movement of rust from southeast to northwest. I shall prepare a project statement on this in time for consideration before any such unofficial cooperation is begun. 4. It seemed desirable both to Prof. Frazer and myself that someone conversant with the rust epidemiology situation in the States accompany Prof. Frazer into far northern Canada at the proper time next summer in order to gain some idea of the movement of rust and to obtain evidence of possible overwintering of urediniospores or other sources of rust infection.

General Weather Conditions. A report on the weather conditions in western Canada seems to me quite important in connection with rust overwintering. In eastern and northeastern Manitoba and in northern and northeastern Saskatchewan the fall has been unusually wet. Immediately after the period of wet weather, cold weather set in. Consequently thousands of acres of grain remain unthreshed. More important from the rust standpoint is the fact that a tremendous amount of stem rust has developed on volunteer grains and grasses. The remaining parts of western Canada east of the mountains have suffered in general from drought and there was little or no rust. The weather became very cold during the trip and a considerable amount of snow fell. At Edmonton the temperature was recorded as 10 below zero on October 23. Low temperatures were general throughout Canada, fifteen below zero being recorded at Calgary and Medicine Hat a few days later. The ground was covered with from three to twelve inches of snow. Heavily rusted grasses were found under the snow and if the weather remains cold, as seems likely, conditions should be very favorable for the overwintering of these urediniospores.

Grasses and Rusts. The following paragraphs contain lists of the grasses found at each of the places named and of the species rusted.

Winnipeg. Grasses found: Hordeum jubatum, Elymus canadensis, E. Virginicus, Bromus spp., Agropyron tenerum, Agropyron repens, Phleum pratense, and Dactylis glomerata.

Grasses rusted: In addition to volunteer wheat,,Hordeum jubatum was heavily rusted. It was a very striking fact that the other grasses had little or no rust. Just what the significance is I am unable to say at present. Timothy was also somewhat rusted but of course with a different biologic form.

Neepawa. Hordeum jubatum and the Agropyrons were very common. Rust was heavy on the Hordeum but not as heavy as at Winnipeg. However, there were abundant urediniospores, some of which were well protected under snow. There were also many green clumps of this grass on which rust was just developing. It is quite likely that in some of the small poplar groves the conditions for rust overwintering are extremely favorable.

Prince Albert. Grasses found: Agropyron richardsonii, Elymus innovatus, E. canadensis, Calamagrostis spp. Agoostis alba, Hordeum hubatum, Phleum pratense, Bromus spp., and volunteer wheat and barley.

Grasses rusted: Here again practically no rust was found except on Hordeum jubatum and volunteer grains. On these, however, the rust was heavy. A heavy snow was falling and rapidly covering all of the grasses many of which were very well protected by brush. Most of the rust was in the telial stage but a great many urediniospores were mixed with the telia. Unbroken uredinia were also fairly common. If overwintering of urediniospores occurs, I am quite positive that the conditions at Prince Albert are such as to enable them to come through the winter. This is due to the fact that so much of the Hordeum jubatum was protected by trees or brush and further to the fact that unbroken uredinia were already well protected by snow.

Calgary. Grasses found: Agropyron smithii, A. richardsonii, A. tenerum, Elymus canadensis, E. innovatus, Hordeum jubatum, Phleum pratense, Bromus spp., Bouteloua oligostachya. Unfortunately no rust was found.

218-C. DOWNY MILDEW INVESTIGATIONS.
(Dr. W. H. Weston, Pathologist in Charge.)

In recent letters Dr. W. H. Weston, Pathologist in Charge of Downy Mildew Investigations, who has been in the Orient studying the downy mildew diseases of corn during the past two years, reports marked and very encouraging progress in his researches.

In a letter dated September 18, he reports concerning a trip recently made to the Island of Cebu, where he collected what may prove to be a new species of Sclerospora. This form he found growing on a certain wild grass and has shown by experiment that it is capable of infecting corn. Such study as he has made thus far seems to indicate that there are two distinct downy mildews peculiar to corn in the Philippines. The discovery of this new species of Sclerospora has caused Dr. Weston to change his itinerary plans so that instead of leaving the Islands for Formosa he will remain at Los Banos, where he has ample research facilities, until he completes the studies arising out of the discovery of this new downy mildew.

To quote from his letter, he says:

"It is absolutely necessary for me to obtain sufficient information on the virulence and range of hosts of this Cebu form (of downy mildew) before I leave here. Save for the inability of the house I occupy to resist these storms (typhoons) I am ideally situated here. My test plots, including all the related wild grasses and all the cultivated crops of near kinship, are behind the house where it is convenient to carry on night work; and while I am on the job I want to finish these inoculation experiments conclusively."

According to Dr. Weston's plans, he will remain in the Philippines until about March 1, after which date he will visit Formosa, Java, and India, staying long enough to study the downy mildews of each country at night. On completion of this work as projected, he plans to return by way of Italy, to make a first-hand study of Sclerospora macrospora, which attacks corn in that part of Europe.

To quote further from his letter of September 18:

"Now that the typhoons have let up a little and we only get the usual rainy season storms, life is more bearable, and work progresses more rapidly.

"We are enjoying the visit of Mr. May who is here getting citrus material. It is a great pleasure to talk with one so recently from Washington and all its interesting doings."

To quote from another letter, in which Dr. Weston comments concerning a trip to the Visagan Islands, the following paragraphs are interesting:

"Another point of considerable interest is that in conversation with native farmers and others in Leyte and Bohol we learned that the downy mildew of maize has been in the Philippines for at least 50 years. In those islands where maize has always been a major crop they have a native name for the disease and a Spanish name which is a corruption of the Spanish expression

meaning frosted, and thus aptly describes the downy, spore-covered leaves. Not only that but through years of bitter experience they have learned, although not understanding the cause, some of the methods of prevention, and are able to tell at what season the disease will be most serious and when and where it will be light.

"All these finds made the trip a most thrilling and exciting one, and, in addition, we had an opportunity to study corn culture there in those Visayan Islands where almost nothing but corn is grown. We saw corn growing in brackish bogs along the shore only a few feet from nipa palms; we saw it in coral sand under cocoanuts; we followed it for miles along upland plateaus where the soil was rich and black as in Illinois; we watched the natives cultivating corn with trowel-shaped bolos on hillsides so steep that the corn stood up at only a slight angle from the slope; and we saw it growing on the tops of rounded hills at the extreme height of land some 2,000 feet above the sea."

218-D. INVESTIGATIONS OF SMUTS.
(Dr. George M. Reed, Pathologist in Charge).

VARIETAL RESISTANCE TO OAT SMUTS.

A series of sowings of oat varieties were made at Aberdeen, Idaho; Ames, Iowa; and Arlington Farm, Virginia. The seed in one set of samples was inoculated with spores of Ustilago avenae, and that in another set of samples was inoculated with spores of Ustilago levis. Check rows, containing uninoculated seed, were sown also.

At Aberdeen, 106 strains and varieties of oats were used in the experiments. Strains of Avena brevis proved entirely free from smut, while strains and varieties of Avena nuda gave 66 to 88 per cent of infection. Strains and varieties of Avena sativa varied greatly in the percentage of infection. A majority of them were infected to the extent of 20 to 30 percent. Two varieties proved to be entirely free. The strains and varieties of Avena sativa orientalis gave about the same results as Avena sativa. In general the strains and varieties of Avena sterilis gave very low percentages of infection, certain strains of Burt and Fulghum being entirely free. Avena strigosa proved to be entirely free from infection.

At Ames, 90 strains and varieties were used. In general similar results were obtained. For the most part, however, the percentages of infection were lower than those at Aberdeen, Idaho.

At Arlington Farm, 135 strains and varieties were used. A very poor stand of many of these was obtained. The percentages of infection were relatively low; in fact, a considerable number of varieties belonging to Avena sativa proved free from smut.

The most important results were the freedom of Avena brevis and Avena strigosa from both smuts; the freedom of two varieties of Avena sativa from both smuts, and the freedom of certain strains of Burt and Fulghum oats, varieties of Avena sterilis, from the two smuts at all three stations.

In a general way, the different strains and varieties reacted similarly to both covered and loose smut. Differences in individual cases were noted, but these probably do not indicate any variation in the real susceptibility of the varieties to these two smuts.

Seeds of a number of oat hybrids developed by Mr. Warburton and Mr. Stanton were inoculated with Ustilago avenae and sown at Aberdeen. The seed from 97 different second-generation plants of a cross between Avena sterilis and Avena sativa var. Sixty-Day were used. All were badly infected, very few giving a percentage of infection below 50. Seed from 49 plants of the second generation of a cross of Avena sterilis var. Fulghum and Avena sativa var. Swedish Select were used. Seven of these proved free from smut and most of the others gave relatively low infection. Similar results were obtained with 43 selections of another cross between these two varieties, five selections proving free from smut.

Some seed of a first generation plant of a cross between Avena sterilis

and Avena nuda also was used. Only a few plants were obtained and these were all smutted, not even one sound head being secured.

RESISTANCE OF WHEAT VARIETIES TO BUNT.

Studies on the resistance of wheat varieties to bunt, or stinking smut, were carried on in cooperation with Prof. E. F. Gaines, of the Division of Farm Crops of the Washington Experiment Station at Pullman. In the fall of 1918, seeds of 88 varieties of wheat were inoculated with spores of Tilletia tritici. The amount of smut present was determined in the summer of 1919. In 10 of these varieties 100 per cent infection of plants was obtained; 70 varieties were infected between 75 and 99 per cent; 3 varieties between 25 and 74 per cent; and 4 varieties from a mere trace to 24 per cent. One variety of spelt, Red Winter, proved free. Other varieties giving low percentages of infection were: Alstroum spelt and Kanred, Kharkov, White Odessa, Titanic, and a Polish wheat.

Eighty-nine varieties were sown at Pullman in the spring of 1919. In general the percentage of infection in the spring wheats was lower than in the winter wheats. The infection of 47 varieties ranged from 75 to 99 per cent of 32 varieties, from 25 to 74 percent; of 8 varieties, from a trace to 24 per cent; and two wheat relatives, Red Spring spelt and Einkorn, proved free. Alaska, Galgalos, Polish, and Velvet Don wheats, and White Spring spelt gave very low infection percentages.

Similar experiments are conducted cooperatively in Oregon, at the Sherman County Branch Station. Under the supervision of Mr. H. M. Woolman, 450 strains and varieties of wheat were sown in the fall of 1918 at Moro, after being inoculated with spores of Tilletia tritici. All of them were infected to a greater or less extent. The following varieties, however, gave very low percentages of infection: Ruby, Koffoid, White Odessa, Jumbuck, Red Hussar, Kharkov, and Turkey.

One hundred and fifty pure-line selections of different Crimean wheats also were tested, several of which gave very low percentages of infection,

Eighty-five Australian wheats also were used, but all proved more or less susceptible. The most resistant were Florence, Wardoo, and Cowra No. 16.

One hundred and twenty Indian wheats also were tested. These all proved to be fairly susceptible.

DEMONSTRATIONS FOR THE CONTROL OF LOOSE SMUT OF WHEAT.

In cooperation with the Extension Service of Indiana a large number of demonstrations for the control of loose smut of wheat were carried out. The general supervision of the work was given by Prof. F. J. Pipal. Mr. Fred E. Robbins and Mr. R. S. Bundy assisted for about two weeks, while Mr. H. K. Vance and Mr. H. L. Lewis spent about a month on the work. Mr. W. W. Wood spent approximately six weeks and Mr. V. F. Tapke also spent considerable time on the work, especially at Shelbyville.

A special type of treating machine, developed by Mr. Russell G. East, county agent at Shelbyville, Indiana, was used at six different places in the State. In four other counties a central plant for treating seed was used, but no special seed-treating machine was installed.

Samples from most of the wheat, before and after treatment, were forwarded to Washington. The samples received from different points in Indiana numbered 135; these were tested for seed germination. Rod rows of both treated and untreated seed also have been sown at Arlington Farm, in order to determine the relative stand and the efficiency of smut control resulting.

- - - - - - - - -

Mr. H. M. Woolman has been busy for the past month looking after the extensive sowings of fall wheat at Moro and other points in Oregon. Plans have been made to continue the varietal experiments on smut resistance at Moro. Especially promising resistant forms are being grown at other points in the State.

Mr. Fred N. Briggs, following the completion of his work at Aberdeen, Idaho, about September 12, proceeded to California, where he is assisting Prof. W. W. Mackie in seeding the varieties of wheat and barley at Davis and Salinas. A large number of varieties and hybrids are being tested for their smut resistance.

Mr. H. K. Vance came to Washington about September 21, where he has been engaged in assisting in seed treatment and in the seedings at Arlington Farm. He completed his work on November 3 and returned to his home at Berlin Height, Ohio.

Mr. V. F. Tapke spent most of the month of September in Indiana in connection with the hot water treatment of wheat for loose smut. He spent a few days in Virginia conducting similar demonstrations at Harrisonburg and Woodstock. Since October 6 he has been in Washington engaged in experiments in connection with the control of loose smut of wheat.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION).

- -

Vol. 11. November 10, 1919. No. 22.
Personnel (Nov. 1-10) and Station (Oct. 16-31) Issue.

- -

SPECIAL CONTENTS

Wheat, oat, barley, and flax yields at Moccasin, Mont.
Wheat yields in tillage experiments at Moro, Ore.
Wheat, oat, and barley yields at Burns, Ore.

PERSONNEL ITEMS

Warren G. Baker, who has been connected with barberry eradication in Iowa, resigned October 31.

Carleton R. Ball, cerealist in charge, left Washington November 5 for LaFayette, Ind.; Bloomington, Urbana, and Chicago, Ill.; St. Paul, Minn.; and other points in the North Central States to confer with officials of cooperating agencies and inspect the cooperative experiments. He will attend the meeting of the American Association of Agricultural Colleges and Experiment Stations in Chicago November 12 to 14 and the meetingsoof several affiliated agricultural societies during the same week, for the purpose of conferring with experiment station directors, agronomists, and others who are in attendance.

R. A. Carroll, after returning from Georgia October 20, resumed his work on the wheat nematode survey in the Shenandoah Valley. He completed the survey November 1 and resigned to return to his home at Opelika, Ala.

Charles E. Chambliss, agronomist in charge of rice investigations, returned to Washington November 5 from a 6-weeks' field trip in Georgia, Alabama, Louisiana, Texas, and California. In Alabama and Georgia he inspected experiments in the growing of rice without irrigation, while his visit to Louisiana and California was for the purpose of studying the extensive rice nurseries at Crowley, La., and Biggs, Cal. In the principal rice-producing sections of Louisiana, Arkansas, Texas, and California, the growing season was ideal, but in Louisiana, Arkansas, and Texas the harvest season was marked by heavy and continuous rains and exceedingly high temperatures, which caused much sprouting of grain where the shocks were not properly made. In California the harvest was from a week to ten days earlier than in 1918. Three early varieties of

rice distributed from the Biggs Rice Station are now grown extensively in California. Of these, No. 1600 was grown on about 35,000 acres this year, No. 1564 on about 18,000 acres, and an early strain of Wataribune was grown on a large acreage.

F. E. Coffman, scientific assistant in charge of cereal experiments at the Akron Field Station, Akron, Colo., returned to his station on October 25 after assisting in the cereal experiments at the Amarillo Cereal Field Station, Amarillo, Texas, for about 3 weeks.

Neal J. Cronin, who has been engaged in the barberry eradication campaign since August 25, resigned on November 7 to resume his studies at Georgetown University.

Marie A. Fitzgerald, of Washington, D. C., appointed as stenographer and typewriter on September 8, resigned November 8.

J. T. Fowler, who has been connected with the barberry eradication campaign in Wyoming, has severed his connections with this department, and returned to his home in Dothon, Alabama.

D. H. Fullerton ended his work on the wheat nematode survey at Appomatox, Va., and arrived at Washington on October 31. He has returned to his home at Mitchelville, Md.

J. M. Hammerly returned October 31 from a short trip to points in eastern Virginia and North Carolina, where he harvested experimental corn plats and studied methods of handling the corn crop.

Lynn D. Hutton, who has been engaged in barberry eradication work in South Dakota since June 7, resigned October 31, as the work on which he was engaged had been completed.

J. T. Holmes, who was transferred from take-all control in Indiana to barberry eradication in South Dakota in July, resigned November 4.

Warren J. Hoyt, who has been an assistant in plant pathology in barberry eradication, aiding with the campaign in Michigan, resigned October 2 to take up college work at the Michigan Agricultural College.

Walter T. Kelley, field assistant in barberry eradication in Michigan, resigned October 5 to accept a position as official tester of dairy cattle at the Michigan Agricultural College.

The edition of 50,000 copies of Farmers' Bulletin 1062, entitled "Buckwheat," by Clyde E. Leighty, was received from the Government Printing Office on November 6 and is now ready for distribution. This is the first complete publication of the Department of Agriculture to be devoted to this crop.

H. L. Lewis, who has been working on the wheat nematode survey in the southeastern part of West Virginia since October 11, finished his work there on November 3 and returned to Madison, Wisc., from where he sent in his resignation.

E. S. McFadden, in charge of cooperative cereal experiments at the Highmore Substation, Highmore, So. Dak., left his station on November 1 for 10 days leave at his former home at Webster, So. Dak., after which he will spend several days at Brookings, So. Dak., conferring with experiment station officials regarding the experiments at Highmore and other points in the State. He will then come to Washington for the purpose of consulting with crop specialists and preparing his annual report.

I. D. Mayer, who was appointed July 1 to assist in barberry eradication in Indiana, resigned on November 3 to accept a position with the Portland Cement Company of Chicago, Ill.

George F. Miller, after finishing the nematode survey in central Virginia, helped Mr. Carroll for a week in the Shenandoah Valley. On November 1 he returned to his home at Eaton Rapids, Mich. Mr. Miller will soon go on active duty in the naval aviation corps as a lieutenant, senior grade.

W. C. Pfaender, who was appointed assistant pathologist March 16, 1919 to aid in barberry eradication in Minnesota, resigned October 11.

Miss Virginia Putnam, bookkeeper in the fiscal section, who was called to her home in Alabama early in September by the serious illness of her mother, returned to Washington October 27.

Leighton L. Rhodes, who was appointed assistant in plant pathology June 7, 1919, to aid in barberry eradication in Iowa, recently took charge as acting assistant state leader of barberry eradication in Iowa, assuming the work left vacant by the resignation of J. J. Wilson.

F. D. Richey left Washington on November 10 for Burdette, Ark., and Bloomington, La Salle, and Urbana, Ill., to study and harvest experimental plats of corn and discuss plans for cooperative experiments.

Clare A. Rood, field assistant in barberry eradication in Michigan, resigned September 23 to resume his studies at the Michigan Agricultural College.

J. W. Saunders, who assisted for a temporary period on barberry eradication in the State of Ohio, recently returned to his home at Richburg, S.C., as the work for which he was appointed has been finished for the season.

R. W. Smith, scientific assistant in charge of cereal experiments at the Dickinson Substation, Dickinson, N. Dak., left his station on November 1 for Washington for the purpose of consulting with crop specialists and preparing his annual report. He was recalled to Dickinson from Fargo, N. D., by the illness of his daughter. Fortunately, the illness proved to be less serious than was at first anticipated, and Mr. Smith will resume his trip at a slightly later date.

Fred J. Stephenson, who was engaged on smut control investigations in Washington and Oregon during the summer, accepted the position of assistant in farm crops at the Washington State College on October 31.

Enoch D. Sylvester, who has been employed on barberry eradication in North Dakota, resigned October 31, as the work for which he was appointed

was finished for this season.

Wilbur A. Thomas, who was appointed assistant pathologist on April 16, and assigned to barberry eradication in Iowa, resigned November 6.

Dr. W. H. Tisdale arrived in Washington on November 5 and will spend the winter here on laboratory and greenhouse studies in connection with the diseases of rice. During his recent extended field trip through the rice-growing districts of California, he made important observations on the occurrence of a hitherto unreported disease of rice. This disease bears a marked resemblance to straight head and is receiving careful study. While in Washington Dr. Tisdale will give particular attention to the investigation of an important rice seedling blight.

Eben H. Toole, assistant pathologist in corn root and stalk disease investigations in Indiana, resigned October 15, as the work in which he was engaged had been completed.

Miss Bonny M. Webber, typewriter, returned to duty November 10 after a month's leave at her home in Missouri.

Joseph J. Wilson, who was appointed assistant state leader of barberry eradication in Iowa on January 13, 1919, resigned November 8, to accept a position as county agricultural agent in Marion County, Iowa.

W. W. Wood, after working on the wheat nematode survey in the western and northern part of West Virginia and in part of southeastern Ohio since October 11, returned to his home at Lawton, Mich.

VISITORS

Glenn Briggs, Agronomist of the Guam Agricultural Experiment Station, was a visitor at the Office during the past week, where he discussed rice investigations with Mr. Chambliss.

Manuel A. Gonzalez of Hacienda Esperanza, Rosales, Pang, Philippine Islands, a rice producer and miller, called at the Office on November 10 to discuss rice production.

PREPARATION OF COPY FOR CEREAL COURIER.

Field employees of the Office of Cereal Investigations are requested to double space all copy for inclusion in the Cereal Courier. This copy often requires editing, and changes in single-spaced copy are practically impossible without rewriting. Double spacing the copy will give opportunity for such editorial changes as are usually needed, without so defacing it that it cannot be read easily by the stencil cutter.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). No report.

GEORGIA

State Experiment Station, Athens, and Substations (R. R. Childs). No report.

TENNESSEE

State Experiment Station, Knoxville, and Substation, Jackson. (C.A. Mooers) No report.

NORTH CAROLINA

State Experiment Station, West Raleigh, and Substations (G. M. Garren). No report.

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor). The wheat nursery and field and increase plats were sown from October 18 to 21, and the plats in the rate-and-date-of-seeding experiments on October 30 and 31. The remainder of the last half of the month was spent in weighing and storing seed from the 1919 crop and in preparing note books for the 1920 crop.

The maximum temperature for the week ending October 18 was 86°,; minimum, 39°; precipitation, 1.75 inches. For the week ending October 25 the maximum temperature was 70°; minimum, 39°; precipitation, 1.11 inches.

NEW YORK

Agricultural Experiment Station, Ithaca (H. H. Love). The weather has continued warm and plenty of rain has fallen so that fall seeding is doing very well and should go into the winter in good shape. The thrashing of the oats and barley has been completed and the weighings are now being made. These have not been completed and, therefore, yields can not be given at this time. Considerable seed has just been forwarded to Chico for planting. This includes

a number of new hybrids which are to be tested for yields and various quantities of first-generation seed of several sorts. These are to be planted so that individual plants may be studied. During the past week a conference of the Farm Bureau Managers was held at the College and a number of these men called to discuss plans for next year's work with small grains.

INDIANA

Indiana Agricultural Experiment Station, La Fayette (George M. Hoffer). John F. Trost and B. H. Duddleston completed the harvesting of experimental plots of field corn in root-rot studies in Indiana. The results from these plots show the yielding capacities of the seed ears which were diseased as contrasted with those which appeared from the germinator test to be disease free. The effects of soil infection in the various plots were also noted. In addition to harvesting the experimental plots and taking samples for moisture and yield determinations, sites and seed ears for further experiments have been selected. The new locations will give additional information on the behavior of infected plants on soil types not now being studied.

The results obtained by Glenn M. Smith in his sweet corn studies are similar to those obtained with field corn, and indicate that most of the infected ears can be detected by inspection and by germinator studies. Mr. Smith has selected many seed ears for his investigations in 1920. The cooperators at De Graff and Chillicothe, Ohio, have employed men to conduct more intensive studies of corn diseases than were possible this year.

Laboratory and greenhouse studies are being made at Purdue University on some of the biochemical phases which have developed in connection with the germinator and resistance studies of seed ears.

Dr. Hoffer recently returned from a trip to Wakeman, Ohio, where he inspected seed corn which will be used in experimental studies next year. He reports that a number of canning companies have used infected seed and for this reason sweet-corn growers are much interested in the progress of the experimental work.

ILLINOIS

Cooperative Corn Rot Investigations, Bloomington (J. R. Holbert). Mr. Biggar is now harvesting the corn disease plot at Media, Ill., and expects to harvest those at Wellington, Ill., the latter part of this week. I was in Champaign October 27.

We have practically finished the harvesting of the experimental corn plots in the vicinity of Bloomington. No final yields will be available until the corn has air-dried and moisture determinations have been made. For the most part, the entire yield of the fifty-hill rows has been stored for a drying sample.

There is an unusually large acreage of fall plowing. Corn husking will soon be in full swing. It has rained 2.01 inches here within the last two days. The weather is much cooler.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson). Most of the

field work in connection with the cereal disease investigations centered at Madison has been completed and the various men are returning to Madison to begin intensive laboratory and greenhouse studies.

The following members of the Office are utilizing the new laboratory and greenhouse facilities for extensive investigations:

C. M. Woodworth has started several thousand flax plants in the greenhouse during the past two weeks to secure plants for cross-pollination and determining the disease resistance of the plants secured from field crosses during the past summer.

Charles S. Reddy arrived in Madison on October 2 and has started a large number of corn plants in the greenhouse to use in connection with his investigations on the bacterial blight of corn. Mr. Reddy is making extensive germination studies as well as inoculations on several hundred corn seedlings.

H. H. McKinney, with the assistance of R. W. Goss, has fenced a quarantine garden for take-all investigations. This garden consists of a plot of ground 20 by 40 feet enclosed with a galvanized iron strip sunk 12 inches into the soil and extending 12 inches above the surface. The sides and top are enclosed with a 1-inch mesh woven wire fence to prevent animals and birds scattering the infected material. Winter wheat has been sown in about 500 pots filled with soil infested with take-all and with clean soil artificially inoculated with diseased wheat plants. Wheat from diseased fields has also been sown on clean soil. This experiment parallels those being conducted on diseased fields in Illinois and Indiana. In addition, experiments are being made in soil temperature tanks to determine the relation of soil temperature to the development of the disease.

Dr. L. K. Bartholomew, with the assistance of Miss Edith K. Seymour, has several lots of oat plants growing in the greenhouse to determine the relation of moisture to infection with oat smuts. They are also operating a series of seven soil-temperature tanks to determine the relation of moisture to infection when the soil temperature is constant. The greenhouse experiments are being paralleled with cultural studies in the laboratory.

Miss Helen Johann, who has been handling the taxonomic studies, has been stationed at Bloomington, Ill., since September 14, re-isolating and culturing the organisms obtained from wheat and corn plants inoculated last spring. Miss Johann returned to Madison October 21 to complete the identification and classification of the Gibberella and Fusaria isolated from the several thousand scab specimens sent in by the cereal disease survey men.

Miss Grace Wineland, who has been assisting in the histological studies on wheat scab, has been stationed at Bloomington, Ill., since September 23 assisting Miss Johann and obtaining histological material from diseased wheat plants from inoculated plots. Miss Wineland will return to Madison about October 27 to assist in the work on the histology of seedling infection with Gibberella saubinetii.

B. Koehler is assisting in extensive investigations on the relation of moisture to the development of Fusarium seedling blight. Investigations are being carried on with several hundred pots containing soil with moisture con-

tents varying from 5 to 60 per cent. Scabbed seed and seed infected with pure cultures of the scab fungus are being used in this moisture series. The experiments are being conducted both in the greenhouse and out doors.

J. G. Dickson is studying the relation of soil temperature to Fusarium seedling blight. A set of seven soil temperature tanks equipped with electric thermostats and electric heaters hold the temperature of the soil to within 2° of any desired point. In addition, seed treatments with the drying oven have been conducted on scab-infected wheat to determine their effectiveness on the control of seedling blight. The treated grain has been sown at Madison, Wis., and Bloomington, Ill.

J. G. Dickson and E. B. Mains, the latter of Purdue University Agricultural Experiment Station, have made quadruplicate sowings of between 300 and 400 lots of fall wheat at five different locations in the Central States, viz., Knoxville and Jackson, Tenn.; LaFayette, Ind.; Bloomington, Ill.; and Madison, Wis. These sowings are to be used in studies of varietal differences in disease resistance, especially resistance to wheat scab and leaf rust.

Dr. Charles Dreschler is assisting Dr. A. G. Johnson in a detailed morphological and mycological study of the Helminthisporium species found on cereals and grasses.

Mr. McKinney left Madison October 16 to inspect "take-all" field plots in Illinois and Indiana.

Visitors during the past two weeks were:

Mr. R. C. Rose of the Office, stationed at East Lansing, Mich., who spent Tuesday, October 7, in conference at Madison; and Mr. L. S. Cheney, who spent Tuesday, October 14, in conference at Madison.

MISSOURI

State Experiment Station, Columbia (L. J. Stadler). The cooperative work at the Missouri Station during October included the sowing of some 2,200 rod rows of wheat. Ninety-six varieties and strains are being tested in 5-row blocks replicated four times. Preparations are now being made for greenhouse sowings for inheritance studies in oats and wheat.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett). The wheat varietal plats were sown during September, but seeding of the fall wheat nursery was delayed by drouth which made it impossible to prepare the land for sowing. The rains which came later were so continuous that seeding could not be done until too late to insure winter survival, consequently the nursery was not sown this year. The corn breeding plats were harvested during the last week in October and the remainder of the corn plats on the station will be harvested during early November.

GREAT PLAINS AREA (South to North).

TEXAS

Amarillo Cereal Field Station, Amarillo (John F. Ross). The weather data for October are as follows: Maximum temperature, 85° on the 1st and 2d;

minimum, 32° on the 28th; average hourly wind velocity, 7 miles; precipitation, 0.57 inch; and evaporation, 4.366 inches. The weather during most of the month was fair and rather cool.

Thrashing of the small grains, which had not been completed sooner on account of unsuitable weather conditions and the lack of an engine, was started on the 14th and finished on the 24th. Mr. F. A. Coffman of the Akron Experiment Farm, Akron, Colo., and Mr. D. R. Burnham of the Office of Dry-Land Agriculture, Woodward Field Station, Woodward, Okla., assisted with the thrashing. It seemed to be almost impossible to get labor for station work. The rod-row wheats have not been thrashed yet.

Seeding of the winter small grains was started on October 31.

Visitors at the station during the month were E. F. Chilcott of the Office of Dry-Land Agriculture, D. A. Bisset of the Office of Foreign Seed and Plant Introduction, A. B. Cron of the Office of Forage Crop Investigations, and R. S. Kirby and W. H. Ballamy of the Office of Cereal Investigations.

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). The last part of October was favorable for seeding wheat and heading milo, and farmers have been rushing this work to completion.

The wheat varietal plats were seeded on October 21, and emerged to good stands on the 31st. All the wheat on the Station was sown during the last two weeks.

Sorghum thrashing is under way on the Station at present, 31 plats from the cereal project having been thrashed, mostly milo and feterita. The dwarf milo seeded on May 31, the fourth date, yielded at the rate of 45.25 bushels of grain to the acre, and the feterita seeded on May 14, the second date for feterita, yielded at the rate of 38.36 bushels to the acre. The grain from about twenty of the plats has not been cleaned yet, so weights are not available. If favorable weather continues, sorghum thrashing will be completed in ten days to two weeks.

Our first killing frost occurred on October 28, with a temperature of 27° F., the maximum temperature for the month was 92°, on October 2. The precipitation for the last half of October totaled 0.11 inch, which fell in three small showers.

KANSAS

Fort Hays Branch Station, Hays (A. F. Swanson). No report.

State Experiment Station, Manhattan (John H. Parker). The first week of October was warm and no frost occurred. Sorghums nearly all matured without injury from frost. Wheat seeding was general, except in those counties where moisture was not sufficient. Rains were general during the second week of the month and there were killing frosts on October 10, 11, and 12 in most of the western part of the State. Rather cool weather also prevailed during the third week, with rain in some parts of the State and a frost on the 17th. The last week of the month has been for the most part cool and cloudy, with more than the usual amount of fog. Heavy frost occurred on the 28th over the entire State.

Wheat sowing has made good progress, except in the few localities where it was hindered by wet ground, and is now practically finished in the northeastern and north central counties and from 75 to 90 per cent completed elsewhere. The wheat fields are looking fine as a rule and conditions are highly favorable for the growing crop, except that in a few central and east central counties the ground is still too dry and hard.

The 1919 crop of wheat is not nearly all thrashed in the western third of Kansas, many counties in that section reporting as high as 40 to 60 per cent of it unthrashed and damaged to a considerable extent by the frequent rains this fall. Much of the thrashed wheat has been piled on the ground in the extreme western counties on account of lack of storage and shipping facilities and rains have also damaged this materially, especially in the northwestern counties where some places report damage to as much as 20 per cent of the piled grain.

The wheat acreage will be much less than that of last year. Various estimates place it at from 5,000,000 to 7,000,000 acres. This reduction is due partly to unfavorable conditions for preparing the ground and seeding, but also to the uncertainty as to prices and increased labor costs.

Seedings of the wheat varieties and experiments with the furrow and surface drills were made at the Agronomy Farm during the first week in October. Sowings of the replicated rod rows in the Agronomy nursery was completed in one day on Sept. 27, when with a crew of five to eight men and boys more than 2,400 rows were put in, representing about 240 distinct varieties or strains. Other sowings in the nursery, all of which were completed by October 10, were as follows: 540 single rod rows, 935 head rows, 220 5-foot rows representing 11 varieties spaced for stooling test and about 1,900 8-foot rows (all spaced) of F_2 and F_3 hybrids, most of them between winter and spring wheats. About 10 varieties of rye are also being grown in the nursery. The experiment on the winter and spring type in small grains which is sown the first of each month is being continued. Nearly 1,000 seeds of crosses obtained in 1919 were also sown. In the Agronomy greenhouse about 1,800 F_3 hybrids of the Kanred x Marquis, as well as varieties for crossing and some F_1 plants are being grown. A preliminary study will also be made this winter in the greenhouse of the effect of soil type, moisture content, and temperature on the variability of the character of beaks in Kanred wheat. This work is to follow up field observations made during the past summer, when it was found that the character was a variable one and that it could not be depended on to distinguish Kanred and Turkey wheat when grown under western Kansas conditions.

Enrollment in the college is back to normal The total students of collegiate grade is about 2,350. There are about 90 students in Grain Crops and a small classes in Forage Crops and Agronomic Experimentation. Professor C. W. Mullen is leaving this Department on November 1, and is to take up editorial work with the Oklahoma Farmer and Stockman. Professor J. W. Zahnley, of the Department of Education of this college, will take Professor Mullen's place.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). Weather conditions in eastern Colorado have been very favorable during October, sufficient rain having fallen to keep the ground in fair condition. A good rain might help

fall grain to better withstand winterkilling. The total precipitation recorded at the Akron Field Station during October was 1.64 inches. The maximum temperature for the month was 81° on October 1, while a minimum of 15° was recorded October 28. Very light snows, which were accompanied by strong winds, fell October 26 and 27.

Field work at the Akron Experiment Farm is practically completed. The last seeding in the combination rate-and-date experiment was made October 17. This grain has not yet emerged, but emergence occurred about October 20 on seedings made earlier in the month. Good stands were obtained from most of the seedings on both nursery and field projects. The stands in many of the nursery rows are much too thick for this locality, unless the precipitation during the 1920 crop season is unusually heavy.

WYOMING

Cheyenne Experiment Farm, Archer (A. L. Nelson). The precipitation for October was 1.48 inches. The temperature has been slightly more favorable for fall-sown wheat than the last half of September. Winter wheat seeded September 15 did not emerge, the seed having decayed, while that seeded October 1 emerged October 27. The seedings of August 15 and September 1 have not made as good growth as those made on the same dates last year. As a whole, however, the fall wheat nursery is doing well.

The work at the station, for the most part, has consisted in preparing for the winter. The windmill, which was wrecked, has been reparied and is giving good service, so that less trouble than usual is anticipated with the water system during the coming winter. It has been almost impossible to obtain sufficient labor and this has caused a delay in fall work.

Sheridan Field Station, Sheridan (Leroy D. Willey). No report.

SOUTH DAKOTA

Bellefourche Experiment Farm, Newell (A. D. Ellison). Weather conditions for the last half of October were characterized by high winds, snow storms, and freezing temperatures. The maximum temperature for the period from October 16 to 31, inclusive, was 60° on the 17th; minimum, -7° on the 25th; precipitation, mostly in the form of snow, 1.41 inches.

Practically all the fall-sown cereal varieties emerged before freezing weather set in. The ground is now mostly bare of snow as high winds and thawing weather have alternated. Very little fall plowing throughout the Project was accomplished this season on account of the unsettled weather conditions.

Following are the yields of varieties of common spring wheat grown on dry land in 1919:

Variety	C.I. No.	Yield in Bu.	Variety	C.I. No.	Yield in Bu.
Kitchener	4800	8.5	Power	3697	6.3
Laramie	6235	7.7	Preston	3081	5.3
Norka	4377	7.5	Pioneer	4324	5.2
Buby	6047	6.9	Huron	4935	5.0
Manchuria sel.	2492-38	6.9	Haynes Bluestem	2874	5.0
Marquis	3641	6.7	Prelude	4323	3.1

Cottonwood Substation, Cottonwood (Manley Champlin). No report.

Vivian Substation, Vivian (Manley Champlin). No report.

Eureka Substation, Eureka (Manley Champlin). No report.

Highmore Substation, Highmore (E. S. McFadden). No report.

State Experiment Station, Brookings (Manley Champlin). No report.

NORTH DAKOTA

State Experiment Station, Agricultural College (Theodore E. Stoa). No report.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). The last half of October was very cold, with frequent and abundant snowfall. The snow is now 6 to 8 inches deep and sleighing has been exceptionally good for the past two weeks.

All flax has been thrashed and cleaned, except a few nursery and hybrid bundles which were harvested after the frost and are not yet dry enough to thrash, and that from the last date-of-seeding plats which is still in shocks covered with snow in the field. The bundles have been moved in to dry in a warm room, and the shocks will be moved in as soon as convenient. Snow is now falling and there seems to be little prospect that it will melt off before spring.

The snow has interfered with the completion of fall work on the station, especially fall plowing and tree pulling, and it looks now as though there would be no opportunity to do this work. In view of the scarcity of hay and feed the long winter now in prospect will be exceptionally hard on stock-owners in this part of the country.

Maximum temperature for the last half of October was 53°, recorded October 18; minimum, -14°, recorded October 26; precipitation, 0.57 inch.

Dickinson Substation (Ralph W. Smith). The weather during the past month has been very unsettled with about two snowstorms each week, some of a blizzardy nature, yet totaling only 0.58 inch of moisture. The minimum temperature for the month was -11° on the 10th, which is said to break the record for low temperature for the month in the State. The ground is now covered with snow to the depth of 5 or 6 inches. A snow of 6 inches or more is reported to have fallen in the northern part of the State during the week, while in the eastern part of the State the ground is only partially covered with snow.

The weather in November is often warm enough to germinate fall-sown grain, and if such weather should yet occur this fall the moisture from the snow would cause the germination of fall grain which as yet has only partly germinated.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May). The yields of the various cereal varieties grown in fiftieth-acre plats repeated five times at the Judith Basin Substation in 1919 are as follows:

FALL WHEAT

Variety	C.I. No.	Yield	Variety	C.I. No.	Yield
Buffum No. 17	3330	7.0	Montana No. 36	5549	5.5
Minnesota No. 1505	5149	7.0	Turkey	1558	5.5
Kharkov sel.	1583-30	6.3	Kharkov	1583	5.3
Girgeh sel.	1580-6-1-10	6.0	Kanred	5146	5.3
Servian sel.	1728-4-1-10				

FALL RYE

Advance	181	4.5	Swedish	137	4.3

SPRING WHEAT

Monad	3320	6.0	Pelissier	1584	4.2
D-5	3322	6.0	Early Red Fife	4932	3.8
Fretes	1596	5.8	Marquis	3641	3.7
Kubanka	1440	5.7	Rysting	3022	3.2
Preston	3081	5.6	Power	3697	2.5
Pioneer	4324	5.6	Haynes	2874	2.3
Arnautka	4064	5.2	Prelude	4323	.8
Hurton	4935	4.8			

OATS

Lincoln	738	15.3	Albion	729	12.5
Silvermine	714	14.7	Sixty Day	626	11.9
Siberian	741	14.1	Sixty Day	165	11.9
Swedish Select	134	13.8	Dakota No. 4.	753	11.9
Banner	751	13.4	Richland	787	11.6
Danish	441	13.4	Kherson	459	11.3
Victory	742	13.4	Nebr. No. 21.	841	10.9
Sixty Day	165-404	12.5			

BARLEY

Coast	690	8.0	Himalaya	1620	4.8
White Smyrna	910	6.8	Franconian	680	4.4
Mariout	261	6.8	Mansury	617	3.5
Beldi	190	6.5	Svanhals	187	3.1
Hannchen	531	5.2	Manchuria	354	2.5
White Smyrna	195	5.0	Nepal	595	.2
Meloy	1176	5.0			

FLAX

Russian	19	3.9	Sel. Russian	3	3.6
Russian	17	3.9	Idaho Common	15	3.6
Steppan	5	3.9	Montana Common	6	3.4
N. D. R. 73	14	3.9	N. D. 1221	3	3.4
Fargo Common	18	3.8	Sel. Riga	2	3.4
Primost	47	3.8	N. D. R. 52	8	3.0
Kazan	4	3.8	N. D. R. 114	13	3.0

The leading varieties of spring wheat at the Judith Basin Substation in the 5 years from 1914 to 1918, inclusive, are Pelissier, with an average yield of 27.6 bushels; Kubanka, 26.9 bushels; and Marquis, 26.5 bushels. The leading varieties of oats for the same 5 years are Swedish Select, 61.9 bushels; Silvermine, 61.7 bushels; and Lincoln, 61.1 bushels. The leading varieties of barley are Hannchen, 47.5 bushels; Beldi, 46.5 bushels; and Franconian, 45.5 bushels. The leading varieties of flax are Fargo Common, 13.8 bushels, and Russian, 13.7 bushels.

The low yields this year were due to the extreme drouth, the seasonal precipitation being only 3.00 inches. The average seasonal precipitation for the 22 years from 1898 to 1919, inclusive, is 8.92 inches, or 5.92 inches above that of this year. The seasonal precipitation this year is less than in any other year for which records are available at this station. Records have been kept at Moccasin since 1908 and at Utica, Mont., 7 miles southwest, since 1898. Old settlers say that it has been the driest summer since 1889. The second driest summer on record was that of 1900, when the seasonal precipitation was 5.03 inches. The yearly seasonal precipitation during the five years from 1914 to 1918 was 9.38, 11.06, 9.45, 6.74, and 7.63 inches, respectively, or an average for the five years of 8.85 inches.

The past month has been one of the coldest Octobers on record, the temperature falling to -9° on the night of October 24. The precipitation in the form of snow has also been rather heavy.

A large part of the fall-sown wheat in the Judith Basin has not emerged yet. Many farmers intend to sow more wheat if the soil is dry enough in the near future.

WESTERN BASIN AND COAST AREAS
(South to North and West)

UTAH

Nephi Substation, Nephi (Aaron F. Bracken). The temperature during October has been unusually low. Frost occurred every night except four, with a minimum temperature of 14° on October 30. The maximum temperature, 72°, occurred on October 18. The precipitation during the month was 1.47 inches, the last three storms coming as snow.

On the station, seeding of fall grains was finished on October 22. All of the first sowings have emerged with good stands, but because of cold weather the later seedings have not germinated and the grain which emerged has made very little growth.

Some of the fall work has been delayed by unfavorable weather, but a week without storms will allow the completion of outside operations.

IDAHO

Aberdeen Substation, Aberdeen (L. C. Aicher). The weather this fall has differed from the previous three years in that much heavier precipitation fell during the months of September and October. Much dry land has been seeded in

spite of the severe drought that has been experienced in the last few years. Some of the grain is up and looking well.

Practically all the fall plowing on the station has been completed. With this out of the way, everything is in readiness for the spring work to begin, insofar as farm operations is concerned. As soon as the outside work is completed, the nursery material for next year's planting, as well as seed for varietal experiments, will be prepared.

Trebi barley and Silvermine oats will be used as nurse crops for alfalfa on the new irrigated section of the farm. An opportunity to increase seed of these two excellent varieties has been anticipated for two years.

Crops in this section are not making the expected yield of half the normal. Sugar beets are practically all harvested and the average will be about 7 tons per acre. The lack of water for irrigation at critical times caused much shrunken grain.

The farmers of Bingham County, through the efforts of the Farm Bureau have just succeeded in closing a deal whereby the Southeastern Idaho fair grounds at Blackfoot now becomes the property of the farmers. A county fair under the auspices of the Farm Bureau or an Agricultural Association will be organized.

Mr. Don H. Bark of the Canadian Pacific Railway recently visited the Station in quest of Grimm alfalfa seed for farmers in his territory. The Superintendent succeeded in locating a few thousand pounds for him.

Present reports indicate that the large storage dam to be put in at the American Falls of the Snake River will soon be a reality. This is estimated to be a $60,000,000 project and is expected to irrigate nearly 1,000,000 acres. There is some apprehension in the Aberdeen section that, if the dam goes in and the water is backed up too great a distance, some of the land on the Aberdeen project may be damaged by alkali and seepage. The height of the dam will determine this, however.

OREGON

Harney Branch Station, Burns (Obil Shattuck). Owing to a shortage of help during the past three months, it has been necessary to slight the office work and put in most of the time in the field.

The month of August was practically frost-free. The minimum temperature reached 32° on the 4th, but no damage was done. The maximum temperature was 95° on the 16th and 17th. There were 15 days during the month with a temperature of 90° or above, which afforded ideal conditions for alfalfa and late-sown barley, the alfalfa practically making a crop in 25 days. The total precipitation for the month was 0.07 inch. Irrigation, soil sampling, and harvesting of dry-land and irrigated cereals comprised the work done during the month.

During September, most of the cereals were harvested and thrashed with the exception of a few late-sown plats. The third crop of alfalfa was harvested and stored, the best plat yielding 2.7 tons, which is excellent for Harney County. The minimum temperature was 26° on the 12th, with the thermometer

registering 32° or below 16 times during the month. The maximum was 85° on the 2d, 16th, and 25th. The precipitation for the first half of the month was 1.06 inches, but this fell in light showers which were of no benefit to the crops. On September 17, 1.06 inches of rain fell which greatly benefited the community and especially the range. A large portion of the dry-farming land is still too dry to plow well.

During the month of October, the harvesting of late cereals and field peas was completed and these crops were thrashed. The dry-land alfalfa seed was also harvested and thrashed. Sugar beets and half-sugar mangels were harvested and stored and both dry-land and irrigated potato varieties were dug and stored.

The minimum temperature during October was 1° on the 27th, with the thermometer registering 32° or below 28 times during the month. The maximum temperature was 69° on the 12th. Snow fell on the 23d, 26th, 28th, and 29th. The precipitation totaled 0.76 inch, but the weather was so cold that it did more harm than good. The land was prepared for the seeding of fall wheat and rye varieties, but weather conditions have prevented seeding. The month of October has broken all records for cold weather since the station was established.

Messrs. Gabrielson and Horn of the U. S. Biological Survey, and F. L. Ballard and Prof. W. L. Powers of the Oregon Agricultural College were visitors at the Station.

The yields of wheat, oats, and barley varieties in field plats on dry and irrigated land follow. Spring wheats and oats on dry land were grown on 20th-acre plats repeated three times, except as noted, and the barleys on dry land were grown on 20th-acre plats duplicated. The irrigated spring wheats, oats, and barley were grown on 20th-acre plats duplicated, and the irrigated winter wheats on 40th-acre plats duplicated.

DRY LAND

Spring Wheats

Variety	C.I. No.	Yield	Variety	C.I. No.	Yield
Little Club	4066	8.8	Early Baart	1697	4.9
Koola	2203-2	6.8	Marquis	4158	4.8
Pacific Bluestem	4067	6.7	Dicklow	3663	4.6
Galgalos	2398	5.9	Aulieata	2407-2	3.9
Talimka	2495	5.7	Bobs	2826-1	3.6
Chul	2227	5.7	Prelude	4323	2.0

The following were grown in single fortieth-acre plats:

Oudebaard	6228	8.0	Ghirka Spring	1517	4.0
Federation	4734	8.0	Preston	5281	3.3
Houston	5208	6.6	Polish		3.0
Acme	5284	5.3	Hard Federation	4733	2.6
Golden Ball	6227	4.3	Red Bobs	6255	1.0

Oats

Variety	C.I. No.	Yield	Variety	C.I. No.	Yield
Silvermine	720	6.8	Big Four		5.1
Nebr. No. 21.	841	6.5	Swedish Select	134-1	3.7
Sixty-Day	625	6.6	Shadeland Climax	681	1.6
Rustless sel.	724	5.9			

Barley

Common (local)		9.7	Trebi	936	6.4
Coast	690	8.4	Swan-neck	187	5.1
White Smyrna	658	7.5	Hannchen	531	3.5

IRRIGATED

Spring Wheats

Early Baart	1697	16.3	Dicklow	3663	8.4
Pacific Bluestem	4067	12.2	Prelude	4323	6.7

Winter Wheats

Wash. Hyb. No. 128.	4326	22.6	Turkey	1558	18.6
Little Club	4066	21.3	Pacific Bluestem	4067	18.0
Kharkov	1442	21.3	Nebr. No. 28.	5147	10.0
Kanred	4156	20.0			

Spring Oats

Rustless	724	45.0	Sixty-Day	625	35.5
Silvermine	720	36.0	Swedish Select	134-1	35.0

Spring Barley

Trebi	936	52.1	White Smyrna	658	35.6
Hannchen	531	49.1	Coast	690	27.9

The dry-land crops were grown on land that at seeding time was moist from 10 to 12 inches in depth, below which the subsoil was so dry that it would not stock to the soil auger. There was no precipitation from seeding to harvest that was of any benefit to crops.

Sherman Co. Branch Station, Moro (D. E. Stephens). The weather was favorable for seeding operations during most of the months of September and October. From September 4 to 11, 1.5 inches of rain fell, which connected the surface and subsoil moisture on well-cultivated summer fallow. All grain sown during the month of September after the rains has emerged with good stands. The total precipitation for September was 1.83 inches.

The month of October was dry, except during the last ten days, during which there was nearly an inch of precipitation. The total precipitation for

the month of October was 1.04 inches. From October 22 to 27, inclusive, there was a period of severe cold weather with snow, with a minimum temperature of 19° on the night of October 26. This is the lowest temperature recorded in October since weather records have been kept on the station.

All seeding, including field and nursery, is completed. The fall wheat varieties have emerged with good stands. Good stands have also been obtained on all the rotation and tillage plats.

Interesting results were obtained this season from the tillage and the rate-and-date-of-sowing experiments with fall and spring wheat. Following is a summary of some of the results:

Yields in bushels per acre of Turkey wheat grown after summer fallow plowed on different dates.

Date of Plowing	1919	7-yr. Average
Fall, 1917, early (dry) disk.	30.9**	24.5
Fall, 1917, early (dry) moldboard	32.8**	27.2
Fall, 1917, late (wet) disk	31.1**	23.7
Fall, 1917, late (wet) moldboard.	33.3**	24.3
April 1, 1918	37.4*	29.1
May 1, 1918	30.7*	26.2
June 1, 1918.	20.4*	21.8

*Average yield of 7 tenth-acre plats.
**Average yield of 4 tenth-acre plats.

Average yield of 8 tenth-acre plats of Early Baart spring wheat after fallow plowed 5 inches deep, 22.0 bushels.

Average yield of 8 tenth-acre plats of Early Baart spring wheat after fallow plowed 9 inches deep, 21.1 bushels.

Yields of Turkey wheat in 1919 sown at varying rates on different dates.

Date of Sowing.	Rate of seeding in pecks per acre.							
	2	3	4	5	6	7	8	Avge.
1918	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.	Bu.
Sept. 9.	31.7	34.3	34.0	36.7	36.0	36.3	32.3	33.1
Sept. 23.	33.0	31.3	26.7	38.0	34.5	39.3	33.8	33.8
Oct. 10.	35.3	38.3	37.7	42.0	40.0	41.0	38.3	38.9
Oct. 25.	27.3	28.7	33.0	31.7	34.7	32.7	30.3	31.2
Average	31.8	33.2	32.9	37.1	36.3	37.3	33.7	34.6

WASHINGTON

Adams Branch Station, Lind (M. A. McCall). No report.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones). No report.

Agricultural Experiment Station, Berkeley (W. W. Mackie). Dr. Ruth F. Allen has arrived from Washington, D. C., to take up work in cytology and histology in relation to the behavior of wheat varieties and hybrids under rust and smut attack. She has been assigned space in the Genetic Laboratory.

F. N. Briggs and W. W. Mackie visited the University Farm at Davis on October 16 to arrange for the seeding of rust and smut experiment plots. Head smut and kernel smut were found severely damaging amber sorgo. Maize smut was found attacking corn, averaging 15 per cent of all plants.

The preparation of seed packets of pure line and hybrid wheats for 12 substations is being done by C. R. Hursh. F. N. Briggs is preparing a large assortment of wheats and barleys from the U. S. Plant Introduction Station at Chico and hybrids from the University Farm at Davis for sowing at Davis and Salinas in the smut experiment.

C. R. Hursh made a rapid rust survey in San Joaquin, Merced, Sacramento and Yolo Counties from October 10 to 14, reporting new rusts appearing on some of the grasses.

C. W. Johnson, Jr., formerly employed in the cereal smut campaign reports efficiating at the demonstrations at the Riverside County Fair in treating wheat with the bluestone-lime dip to prevent smut. The striking feature of the Fair was the handling of all demonstrations by representative local farmers with no experts in charge. Farmers are dipping their seed wheat long in advance of seeding time to avoid delay in drying the seed.

L. Y. Leonard has arrived from Puyallup, Washington, and will take charge of the grass garden to be established at Berkeley for the study of rusts.

W. W. Mackie attended a corn-growers' meeting at Stockton, San Joaquin County, on October 7 and 8. The King Philip yellow dent corn commonly grown in the region was found quite resistant to smut while white dent was badly attacked. In the vicinity of Tracy and Escalon, in the same county, stem rust was found growing abundantly on volunteer wild oats. Other grass rusts also were secured.

Recently W. W. Mackie visited the Washington Agricultural Experiment Station at Pullman, Washington, to confer with Professor E. F. Gaines concerning methods of breeding for smut resistance in wheat and with Professor F. D. Heald and Mr. George Zundel on seed treatment to prevent cereal smuts. At Corvallis, Oregon, conferences with Professor H. P. Barss, H. M. Woolman, Miss Jessie P. Rose, G. R. Hoerner and C. E. Owens were held in connection with smut control, varietal resistance of wheats to smut attack, seed treatment experiments and epidemiology of stem and stripe rusts.

A circular by W. W. Mackie on the use of fungicides for the prevention of cereal smuts was recently published by the University of California. The

subject matter is sustained by the results secured from the cooperative experiments conducted by the Office of Cereal Investigations of the U. S. Department of Agriculture and the University of California in the field, in plots at Davis and in the laboratory at Berkeley.

Dr. W. H. Tisdale visited Berkeley on October 11 in connection with his studies of rice diseases in California rice fields. He is particularly interested in the straight-head trouble of rice.

H. W. Thurston, in charge of the stem rust epidemiology studies in Utah, Nevada, California, and Arizona, spent two days in Berkeley (October 21-22) conferring with the Berkeley members about the rust experiments. He plans to germinate at Berkeley the uredo and teleospores of stem rusts gathered at the substations in California in addition to inspecting the rust plots here.

Plant Introduction Station, Chico (V. H. Florell). No sowings, except the semi-monthly row sowings have been made at this date. The cereal experiments will be conducted on corn-stalk land this year. The weather continues dry and it appears now that sowing operations will be delayed on account of the difficulty of getting the seed bed ready. However, the land for the greater part of the nursery has been plowed and is being harrowed and worked over with a corrugated roller in preparation for seeding. It is planned to begin seeding in the nursery next week.

The first of Dr. Harlan's barley sowings has emerged in most cases, but with rather indifferent stands. The sowing of the second series was made today.

Many farmers in the valley have begun to dry-plow for grain and quite a number are sowing their wheat. A few fields are already sown.

- - - - - - - - - - -

6917

C E R F A L C O U R I E R

Official Messenger of the Office of Cereal Investigations
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION).

- -

Vol. 11. November 20, 1919. No. 23.
Personnel (Nov. 11-20) and Station (Nov. 1-15) Issue.

PERSONNEL ITEMS

Dwight F. Bracken, assistant in the corn root, stalk and ear rot investigations, resigned September 30.

Willard M. Coulter, who has been engaged in barberry eradication work for the past several months, resigned November 20 on completion of his work.

Miss Mayme Dworak, field assistant in the barberry eradication campaign, resigned September 6 to resume her position as teacher of botany in the Lincoln, Nebr., High School.

W. C. Eldridge, of New York, a graduate of the College of Agriculture, Cornell University, class of 1919, was appointed scientific assistant effective November 16 to assist Dr. C. E. Leighty in eastern wheat investigations, particularly in studies of inheritance of wheat hybrids. During the past several years Mr. Eldridge has assisted with the cereal investigations at Arlington Farm during his summer vacations.

Miss Frances Feehan has been appointed field assistant in cereal investigations, effective December 1. Miss Feehan, who has had several years' experience in the Department of Plant Breeding, College of Agriculture, Ithaca, N. Y., will assist in the cooperative cereal breeding investigations being conducted at Cornell University.

Dr. H. V. Harlan on November 14 submitted a paper entitled "The Occurrence of the Fixed Intermediate Hordeum intermedium haxtoni in Crosses Between H. vulgare pallidum and H. distichon palmella," for publication in the Journal of Agricultural Research.

W. C. L. Hines, field assistant, resigned effective October 31. While under appointment in this Office, Mr. Hines assisted with the investigations on corn root and stalk diseases, under the supervision of Dr. James R. Holbert at Bloomington, Ill.

Wayne E. Lear, field assistant in the barberry eradication campaign, resigned November 19, as the work on which he was engaged was completed.

Forest D. McCrea, assistant pathologist in the barberry eradication campaign, resigned November 12, as the service for which he was engaged had been completed.

Hugo Stoneberg, scientific assistant, returned to Washington November 21 from an extended trip in North and South Dakota, Minnesota, and Iowa in the interests of corn improvement.

Wilbur A. Thomas, assistant in the barberry eradication campaign, resigned November 11, as the work on which he was engaged had been completed.

Archie M. Waldie, assistant in the barberry eradication campaign, resigned September 28, as the work on which he was engaged had been completed.

Dr. Orland E. White, who has recently been engaged in collecting grasses in connection with the black-and-stripe-rust investigations, completed his work on November 19 and returned to his former duties with the Brooklyn Botanic Garden.

VISITORS

Brigadier-General B. Enslin, D.S.O., of the Agricultural Department, Union of South Africa, was an office visitor on November 18 to discuss cereal disease investigations.

L. A. Fitz, professor in charge of milling industry at the Kansas State Agricultural College, was an office visitor on November 18.

Mrs. W. O. Gordon of Evansville, Ind., renewed office acquaintances on November 18. Mrs. Gordon was formerly Miss L. M. Fissel, stenographer in western wheat investigations.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). No report.

GEORGIA

State Experiment Station, Athens, and Substations (R. R. Childs). No report.

TENNESSEE

State Experiment Station, Knoxville, and Substations (C. A. Mooers). Carl Kurtzweil left Knoxville November 2 for the Jackson Substation, stopping en route at the Crossville, Murfreesboro and Clarksville substations to sow a series of wheat varieties for leaf and stem rust observations. The seeding of the winter wheat nursery at Jackson was completed on November 15. The first killing frost of the fall at Jackson occurred on November 13.

NORTH CAROLINA

State Experiment Station, West Raleigh, and Substations (G. M. Garren). In 1919, North Carolina had, in all probability, the largest acreage seeded to wheat in the history of the State. The average yield per acre, however, was very disappointing. There was a rank, vigorous growth of straw, but the heads failed to fill well. This failure of the heads to fill well was attributed to the excessive rains that fell throughout the State during the entire blooming period. Definite and reliable figures on both the acreage and yields of all the small grains grown in the State the past season will soon be available, for the law now requires all operators of thrashing machines to report by November 1 to the registrer of deeds in their respective counties the results of the operation of their machines for the past season. The county registrars of deeds are now compiling their reports to the Commissioner of Agriculture.

The rainfall of the season was very unevenly distributed. The excessive rains of midsummer were followed by an extraordinary drought for this humid section. The average precipitation for September was the lowest on record since the establishment of the Weather Bureau in the State in 1887, amounting to only 1.23 inches. This was the average for the entire State and, therefore, it included the limited areas of heavy rainfall in the mountains and along the sea coast. At Statesville, where the Branch Experiment Station is located on which the cooperative small grain experiments are conducted, the average was only 0.75 inch. On this farm, there was not sufficient rainfall to moisten the ground for the preparation of a suitable seed bed before October 12, on which date 1.51 inches of rain fell. This continuous drought seriously affected the late corn crop in the western half of the State and prevented the preparation of the land for seeding the small grain crops at the usual time. It is the opinion of observant farmers that, the acreage sown to the small grains in the State is the smallest for many years. Perhaps these earlier estimates will have to be slightly revised, for there seem to be considerable late seeding of wheat.

The cooperative experimental plats have all been sown except the last one in the date-of-seeding experiment with wheat, which will be sown December 1. All seeded after October 12 were sown under excellent conditions.

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor). Maximum temperature for the week ending November 1 was 46°; maximum, 82°; precipitation, none. For the week ending November 8, minimum, 33°; maximum, 62°; precipitation, .63 inch. For the week ending November 15, minimum temperature, 28°; maximum, 70°; precipitation, 1.25 inches. Total precipitation for the first half of November, 1.88 inches. The first killing frost of the fall occurred during the week ending November 15. Staking of the cereal field plats has been completed.

NEW YORK

Cornell University Experiment Station, Ithaca (H. H. Love). Weather conditions have continued good for the first half of November. On the night of November 13 the ground froze a little, but it has since turned warmer and the fall seeding is looking especially good. The weighing of oats from the nursery has been completed, but the calculations have not all been made, so nothing definite can be stated as to the best strains. Seedings of both wheat and oats are now being made in the greenhouse. A number of hybrid combinations are being grown, also certain varieties to be used for crossing.

INDIANA

Indiana Agricultural Experiment Station, LaFayette (George M. Hoffer). No report.

ILLINOIS

Cooperative Corn Rot Investigations, Bloomington (J. R. Holbert). No report.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson). No report.

MISSOURI

State Experiment Station, Columbia (L. J. Stadler). No report.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett). No report.

GREAT PLAINS AREA (South to North).

TEXAS

Amarillo Cereal Field Station, Amarillo (John F. Ross). No report.

OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). The thrashing of the grain sorghums on the cereal project will be completed in one day's run. There will then remain about 23 plats of sorgos, the kafir on the Dry-Land Agriculture project, and two increase fields of grain sorghums to thrash. The grain sorghum yields will probably equal or exceed those of 1915, which is the record year to date.

Wheat is up and growing well in this section, and most of the grain sorghums have been headed and put in ricks.

The maximum temperature for the first half of November was 74°, on the 2d, while the minimum was 15° on the 12th and 13th. The rainfall was 1.40 inches on November 9 and 0.10 inch on the 10th, making a total of 1.50 inches for the month to date.

KANSAS

Fort Hays Branch Station, Hays (A. F. Swanson). The thrashing of the grain sorghums was completed on November 7. The following yields were obtained:

KAFIR GROUP.

Variety		Field weight of crop, pounds per acre.	Grain yield, bus. per acre.
C.I. 340	Dawn	6,100	34.1
F.C.I. 02810	Dwarf Black Hull	4,470	26.7
- - -	Dwarf Black Hull	3,370	19.8
C.I. 1472	Sunrise	5,590	24.1
C.I. 71	Black Hull	3,500	19.1
C.I. 204	" "	5,030	20.0
C.I. 432	Pink	4,180	24.1
C.I. 432	"	2,620	15.2
C.I. 432	"	3,520	22.7
F.C.I. 02820	Red	5,270	27.6
C.I. 34	"	6,840	29.7
C.I. 342	Dwarf White	3,080	16.8
C.I. 314	White	3,940	19.0
F.C.I. 02249	Progressive	5,000	32.9
F.C.I. 1481	Shrock	6,010	34.6

FETERITA GROUP

- - - - -	Local	4,400	31.4
- - - - -	Dwarf	2,390	20.5
Tex. 133	Spur	4,670	34.9
- - - - -		4,650	34.7
S.P.I. 22329		4,690	34.1
C.I. 182		4,510	32.1
C.I. 182		4,560	34.2

MILO GROUP

S.P.I. 18684	Dwarf	6,810	41.3
C.I. 236	"	6,110	31.8
C.I. 332	"	6,260	36.4
C.I. 332	"	6,210	37.5
C.I. 77	Standard.	7,600	33.3
C.I. 234	"	8,610	34.4
F.C.I. 5899	Dwarf White	5,950	38.2
--------	" "	7,640	39.0

Variety		Field weight of crop pounds per acre.	Grain yield, bushels per acre.
	MILO GROUP (Continued)		
F.C.I. 5886	White	5,510	37.0
C.I. 352	"	7,410	29.0
C.I. 352	"	7,580	28.8
	MISCELLANEOUS GROUP.		
-------	Dwarf Hegari	6,290	27.8
K.S.A.C. 486	Darso	4,970	32.2
F.C.I. 02554	Early Buff durra	4,710	37.9
C.I. 85	Shallu	6,330	35.9
F.C.I. 9033	Freed	4,360	22.1
C.I. 350	Freed	5,390	21.8
C.I. 171	Manchu Brown kaoliang	4,720	35.9
C.I. 293	Dwarf Shantung kaoliang	2,310	14.4
	SWEET SORGHUM GROUP.		
F.C.I. 1614	Dakota Amber,	5,330	37.5
F.C.I. 8572	Early Black Amber	7,790	31.5
--------	Black Amber	6,710	34.1
F.C.I. 7038	Black Amber	8,510	35.5
S.P.I. 17548	Red Amber	8,960	33.2
KSAC 472	Kansas Orange	8,100	21.0
--------	Sourless	10,090	21.1
KSAC 487	Dwarf Sumac	7,630	35.6
FCI 02552	Early Sumac	8,470	38.3
KSAC 483	Sumac	16,790	57.6
FCI 1831	Sumac	18,480	39.2

Colby Bloody Butcher corn, grown for comparison with the grain sorghums, produced 4,290 pounds of total crop, of which 17.4 bushels was grain. Dwarf broomcorn, C.I. No. 442, produced 2,150 pounds of total crop. Sumac sorgo, F.C.I. No. 1831 and Shallu were late in maturing, and were not as dry as the other lots when weighed. Pink Kafir was too thin to produce a good yield.

Wheat in this section is going into the winter in excellent condition. All fall plowing on the cereal project has been completed and the necessary precautions have been taken against soil blowing.

State Experiment Station, Manhattan (John H. Parker). No report.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). Weather conditions at Akron have been very bad for a week. No field work has been possible as the ground is covered with snow. The snow is badly drifted, many drifts being 5 to 6 feet deep.

Harvest of the corn from the ear-row experiment was completed just before this storm. The yields secured were very light, due to the extremely dry

season. The highest yielding row produced about 18 bushels to the acre.

WYOMING

Cheyenne Experiment Farm, Cheyenne (A. L. Nelson). The month so far has been quite cold, with considerable wind and snow. The minimum temperature reached 10° below zero on the 11th, at about 3 p.m. This temperature was accompanied by a very heavy wind and snow, making the blizzard terrific. The total precipitation for the first half of November was 0.76 inch.

During the first week of November, the work at the station consisted of husking and weighing the corn and stover on the Dry-Land Agriculture plats. Mr. Grace took charge of this work. Material for the plastering of the bunk house was also hauled to the station, but due to the storm all work has practically been discontinued, except hauling hay for the dairy. When this is finished, fall work will be complete.

Sheridan Field Station, Sheridan (Leroy D. Willey). No report.

SOUTH DAKOTA

Bellefourche Experiment Farm, Newell (A. D. Ellison). No report.

Cottonwood Substation, Cottonwood (Manley Champlin). No report.

Vivian Substation, Vivian (Manley Champlin). No report.

Eureka Substation, Eureka (Manley Champlin). No report.

Highmore Substation, Highmore (E. S. McFadden). No report.

State Experiment Station, Brookings (Manley Champlin). No report.

NORTH DAKOTA

State Experiment Station, Agricultural College (Theodore E. Stoa). No report.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). The weather continued cold and there was much snow during the first half of November. During this time temperatures hardly rose above freezing at any time. The precipitation recorded for this period amounted to 1.19 inches, of which 0.91 inch was recorded November 9. On November 15 there was a sudden rise in temperature and since that time to November 18 temperatures have been comparatively high, so that most of the snow which had fallen has melted. The melting process has been slow, however, and, as the ground was not frozen in any marked degree before the first snow, most of the moisture is being absorbed. This is indicated by the fact that the melting of the snow has not been followed by any noticeable rise in the Heart River. The weather at this time is milder than any we have had for about six weeks.

The flax shocks from the June 15 date of seeding experiments which were covered with snow in the field did not dry very satisfactorily even after being moved into the warm greenhouse. These have finally been thrashed and cleaned which completes the field work for the season.

Maximum temperature for the first half of November was 41, recorded Nov-

ember 16; minimum, -11°, recorded November 13.

Dickinson Substation (Ralph W. Smith). The year 1919 continues to break records. After having the hottest and driest summer ever recorded at this place, the winter promises to be the longest and coldest, judging by its beginning. The ground has been frozen since about October 22. The temperature dropped to 11° below zero on October 26, and has been below zero six times during the first half of November, the coldest being 10° below on November 12. The maximum temperature was 41°, on November 15. The mean temperature for the first half of the month was 14.5°, as compared with a normal mean of 28.7° for the entire month. Several light blizzards have occurred this month; snow fell on six days and high winds drifted the snow on other days. The precipitation to November 15 was 0.32 inch.

The early beginning of winter will be an unusual hardship to those having stock to winter, as feed is scarce in this section and that which is shipped in is high in price. Large quantities of thistle hay were stacked by many farmers and, although not the best of feed, this will help keep the stock from starving.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May). The fall-sown wheat acreage in the Judith Basin this year is less than was intended to be sown, due to the unusually heavy snowfall which has covered the ground since about October 20. However, more wheat has been sown this fall than in any previous year since 1915. Probably 50 per cent or more of the wheat had not emerged when the first snow fell. Most of it was sown late on account of the dry condition of the soil at the usual sowing time.

The precipitation for October was 1.43 inches, which is 0.26 inch more than the average of the past 22 years. Most of this was in the form of snow.

No fall stand counts have been made on the plats in the experiments to determine the best methods of seeding and treatment to prevent winterkilling, as all are covered with snow. The straw has been spread on the straw-mulch plats.

W. P. Baird, representative of the Office of Dry-Land Agriculture at this station, left November 12 on an official trip to the Northern Great Plains Field Station at Mandan, N. Dak.

WESTERN BASIN AND COAST AREAS
(South to North and West).

UTAH

Nephi Substation, Nephi (Aaron F. Bracken). No report.

IDAHO

Aberdeen Substation, Aberdeen (L. C. Aicher). No report.

OREGON

Harney Branch Station, Burns (Obil Shattuck). The first part of the month has been devoted to seeding of winter wheat and rye varieties, both on

the dry and irrigated plats. The fall plowing is well under way, and if weather conditions permit, will be finished in good shape.

The land for the winter wheat nursery has been prepared and 130 head rows 5 feet in length have been seeded. The remainder will be put in during the week.

Fall plowing is in progress in the vicinity of the station.

The weather conditions in general have been cold. On November 7, 3.75 inches of snow fell.

Sherman Co. Branch Station, Moro (D. E. Stephens). No report.

WASHINGTON

Adams Branch Station, Lind (M. A. McCall). No report.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones). No report.

Agricultural Experiment Station, Berkeley (W. W. Mackie). No report.

Plant Introduction Station, Chico (V. H. Florell). About 3,800 nursery rows have been sown up to November 15. The sowings include barley varieties and selections, miscellaneous and Australian varieties of wheat, wheat selections, and varieties of oats and flax, as well as approximately 1,000 rows of hybrid material for Dr. H. H. Love. The hybrid and classification wheat nurseries have not yet been sown.

The weather continues dry and it has not been possible to prepare the land for sowing the field plat experiments.

The third sowing in Dr. Harlan's barley experiment was made November 15. The two previous sowings were irrigated more than a week ago, but no emergence has thus far been observed.

The various California fruit growers' associations held their annual conference at Chico from November 10 to 15. The meetings were well attended. Half a day was given to a visit of the Plant Introduction Garden. The delegates were much interested in the various plant introductions which may prove of value to their industry.

---------i----------

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION).

- -

Vol. 11. November 30, 1919. No. 24.
Personnel and Project Issue.

- -

PERSONNEL ITEMS

C. R. Ball, cerealist in charge, returned on November 23 from attendance at the Chicago meeting of the Association of Agricultural Colleges and Experiment Stations and affiliated societies and a subsequent field trip in the States of the Ohio and Mississippi valleys. The present and future cooperative activities between the Office of Cereal Investigations and of various State experiment stations were discussed with station directors, agronomists, pathologists, and plant breeders at Chicago and also at Bloomington and Urbana, Ill., La Fayette, Ind.; East Lansing, Mich.; University Farm, St. Paul, Minn.; and Madison, Wisc.

The outstanding feature of the Chicago meetings was the emphasis laid on the importance of agricultural research as fundamental to progress and on the necessity of adequate training of research workers and adequate funds for the support of their investigations. This fundamental principle was voiced not only by experiment station workers but by extension workers both in formal papers and private conversations. Realization of the fundamental importance of National agricultural production which was compelled by conditions obtaining during the war evidently has not been forgotten and is likely to bear increasing fruit as the years go by.

Morris Bolnick, who has been assisting Mr. Levine in the culturing of rusts in the greenhouse in connection with the cooperative investigation of black rust at Minnesota experiment station, has resigned effective November 18.

Stewart R. Cooper, who has been engaged in the barberry eradication campaign in Iowa during the season, has completed the work for this year and resigned effective November 30.

Frank J. Dietsch, who took part in the eradication of barberries in Iowa during the summer and has been assisting Mr. Hoerner in collecting black rust material in the Northwest during the autumn, has resigned effective November 24.

Arthur D. Ellison, who, since his return from military service last winter, has been in charge of the cooperative experiments of this Office at Bellefourche Experiment Farm, Newell, S. Dak., has resigned effective November 30 to become County Agent of Butte County, with headquarters at Bellefourche, S. Dak.

Gilbert D. George, illustrator, who has been making cartoons, posters, animated moving pictures, and other publicity material for the past year or more, has been appointed as Agent, effective November 16, and hereafter will devote only half time to this work and half time to similar work for the Minnesota College of Agriculture and Agricultural Experiment Station.

Prof. John M. Holzinger, who has been assisting in the location of wild barberries in southeastern Minnesota during the summer, resigned on November 22 to return to his duties in the Department of Botany of the Winona State Normal School, Winona, Minn.

Jacob R. Jacobson, field assistant in the barberry eradication campaign in Wisconsin, completed the work for which he was employed on November 28, on which date his appointment terminated.

Elmer W. Knight, who has been assisting in the rust survey in the Pacific Coast States during the summer, has completed his work for the season and resigned effective November 15, at which time he returned to his home at 315 Pleasant Street, Grass Valley, Cal.

Miss Vera McGinnis, mess cook at the Cheyenne Field Station, Cheyenne, Wyom., resigned her position on November 26.

VISITORS

E. J. Iddings, director of the Idaho Agricultural Experiment Station, called at the Office November 24 to discuss the cooperative cereal investigations at Aberdeen and other points in Idaho.

218-B. INVESTIGATIONS OF RUSTS.
(Dr. H. B. Humphrey, Pathologist in Charge.)

CROWN RUST INVESTIGATIONS.

(Dr. I. E. Melhus.)

The investigations of crown rust are separated into four divisions: (1) Studies of biologic forms, (2) Studies of strains within biologic forms, (3) genetics in the development of resistance, and (4) the relation of the alternate host (American species of Rhamnus).

In Europe the investigators have named and described five species of crown rust. A limited amount of work has been done and additional study is in progress to ascertain if the same five species exist in America. Crown rust on oat varieties and on grasses has been collected from various localities for cultural work. Studies are in progress to determine whether the crown rust of America comprises the same biologic forms as does that of Europe, or whether the grasses lack this host specialization.

If each locality possesses a different strain of crown rust, the breeding problem becomes complicated. The strain studies are confined to determining the existence of these specialized strains within the biologic forms. Ten or more varieties of oats selected from results of 5-year tests, some resistant and some susceptible to crown rust at Ames, were sown at the various experiment stations throughout the country. The rust of each particular region was allowed to infect these varieties naturally. Rust readings will be taken and collections made for greenhouse work this winter. The responses of these strains will be compared with the reaction of previous collections from other localities.

Unfortunately, the oat varieties showing resistance to crown rust at Ames are not all accepted as suitable commercial varieties. Therefore, oat-breeding nurseries were sown at Ames, Iowa, and at Iron River, Wisc., containing both resistant and good commercial varieties. Crosses were made and the F_1 generation is to be matured in the greenhouse this winter. Selections from the F_3 generation of another lot of hybrids have been made for field seeding next spring.

It is imperative that we learn the relationship of all our American species of Rhamnus to crown rust on oats and grasses. We must know what relationship exists between the American alternate host and the biologic forms of crown rust, and also how important a factor the different species of Rhamnus are in outbreaks of crown rust. To date, many data have been gathered on these questions, and further work is in progress. Considerable research was carried on with Rhamnus last spring. All the American species have now been collected. These are heeled in for the winter, and will be started in the greenhouse during February. An abundance of teleutospore material of different biologic forms of crown rust has been collected for cultural experiments with Rhamnus in the spring.

STRIPE RUST INVESTIGATIONS

(C. E. Owens.)

Stripe Rust Survey.

The stripe rust (Puccinia glumarum) survey, carried on during the summer of 1919, has been terminated.

Stripe rust was noted early in April at Moro, Oreg., and before the close of the month had been collected at various points in this State by the writer and others. The real scouting campaign was not begun, however, until June 7. At that time, E. W. Knight was sent into the State of Washington and J. C. Bell started on a scouting trip in eastern Oregon. At the close of June Mr. Bell resigned and J. T. Bregger succeeded him. Mr. Knight spent over three months in Washington and covered the greater part of that State fairly well. In September he was transferred to Nevada, where he spent about a month, and then proceeded to Arizona where he continued the survey until November 15. In Washington, Mr. Knight made a total of fifteen collections of stripe rust in eight different localities both east and west of the Cascades. He reported no collections from Nevada and to date has reported none from Arizona.

Mr. Bell made several collections in various localities east of the Cascades in Oregon. Mr. Bregger spent over three months scouting in Oregon and worked in almost every county in the State. Altogether, he made 51 collections in 42 localities in 21 different counties.

Mr. Owens made a trip through the States of Colorado, Wyoming, Montana, Idaho and Washington during June, finding the rust in the last three States but not in Colorado nor Wyoming. During the growing season he made two trips to Moro, Oreg., to take notes on the stripe rust epidemic at that place. Quite extensive data were accumulated as to susceptibility of varieties. During the latter part of August and the first days of September, he went to Vancouver Island, B. C. He found the stripe rust plentiful on grasses in certain parts of that island, including Victoria and the town of Duncan forty or fifty miles north of Victoria.

Many collections were made in California during the early part of the season by Prof. W. W. Mackie and his assistants.

C. W. Hungerford, plant pathologist at the University of Idaho, had plant-disease-survey scouts in the field during the season, and stripe rust was found in many localities.

The rust was found on wheat quite frequently in this survey, some of the most commonly infected varieties being Little Club, Early Baart, Fortyfold, and Jones Winter Fife. However, by far the greater number of collections was made on species of grasses. The grass species found as hosts of the stripe rust during the present season are in the six genera, Agropyron, Bromus, Elymus, Hordeum, Sitanion, and Phalaris.

Greenhouse Experiments.

Extensive greenhouse studies have been planned for the coming winter. These studies will consist largely of an attempt to distinguish biologic races, but will include some incidental investigations of seed, chaff, straw, and soil transmission of the disease.

The rust is beginning to appear again on native grasses in nature where it had lain more or less dormant during the latter part of the season when the weather was extremely dry. It is now possible to collect fresh, viable urediniospores from various grasses to begin culture work in the greenhouse.

Histological and Cytological Studies.

In connection with the greenhouse culture experiments, it is planned to fix, imbed, and section certain material for a detailed histological and cytological study of infection and development of the stripe-rust parasite and of the problem of susceptibility and resistance.

Stripe-Rust Nursery.

In July, final notes were taken on the rust nursery and the varieties were harvested. It is planned to sow about 350 varieties of wheat and several varieties each of barley, rye, and oats in the rust nursery this fall.

The success of the rust nursery at Corvallis this year is uncertain. The land was not assigned until near the end of October, and fall rains began before the land could be prepared for seeding. At the present time, it is raining every day, with predictions for continued rains, so that it is very uncertain when seeding can be done, if at all. However, if the rain should cease for a sufficient time, it will be possible to seed at any time within the next several weeks and get a crop. It is hoped that we may get have a good stripe rust nursery at Corvallis.

RESTRICTIONS GOVERNING MOVEMENT OF CEREAL SEEDS AND PLANTS INFECTED WITH STRIPE RUST.

- - - - - - - - -

Repeated greenhouse, field, and laboratory experiments involving the sowing of thousands of kernels of wheat infected with Puccinia glumarum have given only negative evidence of the possibility of subsequent infection arising from either seed-borne urediniospores or mycelium. These experiments have been conducted over a sufficiently long period of time and under such a variety of conditions as to make it reasonably safe to conclude that rusted seed does not serve as a carrier of infection from one wheat crop to the next. The restrictions placed upon the movement or transfer of seed grain from points west of the 103d meridian to points east of that meridian, therefore, are removed. However, it is suggested that in all cases where seed grown west of the 103d meridian is sown east of that meridian the resulting crops should be closely watched during a period of two or three crop seasons for the possible occurrence of stripe rust.

The restrictions, however, still hold against the movement of dried or living plants of wheat, barley, rye, or any of the wild grasses infected with stripe rust, except where these specimens have been subjected to treatment by live steam in an autoclave or other steam sterilizer.

BLACK STEM RUST INVESTIGATIONS.

BIOLOGIC SPECIALIZATION (E. C. Stakman).

The Determination of New Forms.

The effort during the past month has been concentrated on an attempt to finish the cultural work with as many strains as possible. The conditions for greenhouse work were favorable during the first half of the month, but were quite unfavorable during the second half. Fortyone strains of Puccinia graminis on varieties of wheat have been identified and classified into twelve biologic forms. No new forms were discovered during the month.

Only six new specimens of P. graminis have been received and cultured. Four of these were collected on wheat and two on Hordeum jubatum. The collections were made at Winnipeg, Manitoba; Casa Grande, Ariz.; Columbia, Mo.; Westville, Okla.; Berkeley, Cal.; and El Reno, Okla. Most of the forms were sent in by epidemiology men.

Reaction of Varieties to Known Forms.

Nothing of news value has developed along this line. The work has continued and further progress has been made, although the unfavorable weather has delayed the obtaining of definite results. The amount of uredinial material of the various "pure lines" has been increased preparatory to tests of their constancy.

Origin and Nature of Biologic Forms.

Progress has been made, but no definite results have been obtained.

(THE NATURE OF RESISTANCE (E. C. Stakman).

The potometers for studying the effects of rusts on transpiration are in operation and the various mineral nutrients are being added. Inoculations will be made during the next few weeks. A new series of potometers for studying the effects of mineral stimulants of transpiration on rust injury will be set up soon. Attempts have been made to germinate teliospores for further infection studies on resistant barberries and Mahonias. However, up to the present none of the special treatments has induced the spores to germinate.

EPIDEMIOLOGY STUDIES (E. C. Stakman).

The work of spore germination has been begun. Most of the stations at which spore-germination tests will be made have been visited. Material has been collected and the results of the germination tests are available. In

the Southern States some additional seedings of cereals for rust-overwintering studies have been made.

It is significant that there is a marked decrease in the viability of urediniospores of stemrust from south to north. For instance, in the south central district the average percentage of germination of urediniospores of Puccinia graminis tritici was 29. In the north-central-west district, on the other hand, only 6% of the spores germinated. In the south-central district the average percentage of germination of P. graminis avenae urediniospores was 25, while in the north-central-west district only 1 per cent of the spores germinated. The average percentages in the northeastern, north-central-east and northwestern districts are more nearly like those in the south-central district than like those in the north-central-west district. The percentage of viable urediniospores in the north-central-west district dropped very rapidly during the cold, wet weather the first part of the month. A heavy snowfall occurred November 26 to 28. It will be extremely interesting to determine the effect of the snow cover on the germination of the next set of samples, which will be made for many of the stations in the north about the middle of next month.

Northeastern District

Mr. Krakover spent the month in making observations on the condition of cereal rust hosts and collecting specimens for germination tests in New York, Vermont, Maine, Massachusetts, New Hampshire, Connecticut, New Jersey, and Delaware.

Mr. Murphy visited the stations in Pennsylvania and spent considerable time in looking over the barberry herbarium at Highland Park, Rochester, N.Y. This herbarium contains 64 different species and varieties of barberry and four species of Mahonia. Mr. Murphy also collected valuable information from the men at the Highland Park herbarium, who are keeping records of the various birds which feed on the seed of the different species of barberry.

The average urediniospore germination in the northeast district is as follows: Puccinia graminis tritici, 51 per cent; Puccinia graminis avenae, 42 per cent; Puccinia graminis secalis, 36 per cent; Puccinia graminis agrostis, 31 per cent; and Puccinia graminis phleipratensis, 55 per cent.

North-Central-East District.

The spore germination stations in Wisconsin, Michigan, Illinois, and Ohio were visited during November by Rose and Cheney.

The vitality of the urediniospores has decreased considerably during the month. The percentage of viability of urediniospores is as follows: Puccinia graminis tritici, 20%; Puccinia graminis avenae, 19%; P. graminis secalis, 17%; P. graminis agrostis, 20%; P. graminis phleipratensis, 13%.

North-Central-West District

Mr. Christopher visited stations at Ames, Grinnell, Davenport, Dubuque, and Armstrong, Iowa, and took notes on the prevalence and severity of stemrust. He also collected spores for germination tests.

The observations show that P. graminis tritici was very prevalent on cereals and grasses. P. graminis avenae was found in every State in the district, but it was not so abundant as P. graminis tritici. P. graminis secalis was found only in Minnesota, Iowa, and South Dakota, while P. graminis phleipratensis was abundant in every State except Colorado. P. graminis agrostis was found in small amounts in Minnesota and Iowa. P. triticina, P. dispersa, and P. coronata were common everywhere. P. glumarum was found in Montana.

The uredinial stage of stemrust predominated during October, but it changed rapidly to the telial stage in November. However, some uredinial material is still present on the green leaves of cereals and grasses and between the leaf sheaths and the culmas.

In Montana and Wyoming, stemrust was most prevalent on fall-sown cereals. Probably because of cold weather during October, only a trace of stemrust appeared on fall-sown cereals in Nebraska, Iowa, Minnesota, and the Dakotas. In Montana and Wyoming the winter wheat was sown early enough to enable the rust to develop before the weather became cold.

The percentage of viable urediniospores has decreased strikingly during November. At the St. Paul station the average percentage of germination were as follows: P. graminis tritici, 6%; P. graminis avenae, 1%; P. graminis secalis, 0.4%; P. graminis phleipratensis, 15%; P. triticina, 6%; and P. dispersa, 15%. Urediniospores of P. coronata did not germinate. The decrease in the viability of spores was undoubtedly due to the cold, wet weather during most of November.

Mr. Thiel spent considerable time on experiments to determine the germinability of urediniospores of P. graminis under control conditions.

Northwest District

Nine stations in Oregon, two in Idaho, and two in Montana were visited. Specimens were collected for germination studies and more material was collected for the barberry and Mahonia garden at Corvallis, for which a permanent plot was assigned Mr. Hoerner at the College Farm.

Additional information on the distribution of species of Mahonia and Berberis was obtained as a result of questionnaires sent to county agents and curators of herbaria in various States in the district.

Following is the average percentage of spore germination in Oregon and Idaho. P. graminis tritici, 30%; P. graminis phleipratensis, 22½%.

Southwest District

Mr. Thurston reports that the stations at Mesa and Tucson, Ariz., were visited during November. No rust whatever was found. Different seedings of oats, barley, rye, and wheat were made at each of these stations. A careful search for rust was also made in the Salt River and Santa Cruz Valley. Numerous barley fields in which the plants were from 4 to 10 inches high were examined and no rust was found.

South-Central District

Twenty-six towns in Texas, Oklahoma, Louisiana, Arkansas, Missouri, Kansas, and Colorado were visited by Mr. Kirby or Mr. Ballamy. No rust was located in a careful survey in eight localities in Kansas. Apparently the dry weather during September and October killed the urediniospores which had oversummered on cereals and grasses. Naturally developed P. graminis tritici, P. graminis avenae and P. graminis secalis were found at Westville, Okla., and St. Charles, Mo. P. graminis secalis was found also on volunteer rye at Fayetteville, Ark. P. graminis occurs in plots in which it has been cultured during the summer on cereals and grasses at Springfield, St. Joseph, and Columbia, Mo.; Manhattan, and Overland Park, Kans.; and at Norman, Okla.

The following figures show the average percentages of viable urediniospores of P. graminis in Missouri and Kansas. P. graminis tritici, 29%; P. graminis avenae, 25%; P. graminis secalis, 23%; P. graminis agrostis, 27%; and P. graminis phleipratensis, 26%. In Oklahoma and Arkansas the percentages were as follows: P. graminis tritici, 71%; P. graminis avenae, 53%; P. graminis secalis, 5%; P. graminis agrostis, 29%; and P. graminis phleipratensis, 16%.

Southeast District

Mr. Ludwig visited the stations at Canton, Miss.; Union City and Nashville, Tenn.; and Baton Rouge, La. Although careful search was made for stemrust, none was found except at Union City. Here a single uredinium of P. graminis was found on a leaf of barley. Question: Where does the southern stemrust come from and where does it go? This query is old but not dead. Artificial inoculations with P. graminis were resorted to. Leaf rusts were common at all stations and germinated readily and abundantly.

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION).

- -

Vol. 11. December 15, 1919. No. 25.
Personnel (Dec. 1-15) and Station (Nov. 16-30) Issue.

- -

SPECIAL CONTENTS.

Grain sorghum yields at Woodward, Okla.
Wheat yields at Cheyenne, Wyo.

PERSONNEL ITEMS.

H. Howard Biggar, scientific assistant in corn root, stalk, and ear rot investigations at Bloomington, Ill., came to Washington on December 1 for the purpose of preparing material and compiling references for a paper on the Correlation of Early Growth, Variation, and Productivity of Maize as Influenced by Certain Pathologic Factors, of which he is joint author with J. R. Holbert and James G. Dickson. The paper is based on experiments made at Bloomington during the past summer and is to be presented at the annual meeting of the American Phytopathological Society, to be held at St. Louis, Mo., during convocation week. Mr. Biggar plans to be in Washington about a month.

A. F. Bracken, scientific assistant and superintendent of the Nephi Substation, Nephi, Utah, arrived in Washington December 9 to consult with crop specialists regarding cooperative cereal experiments on the Nephi substation and to prepare his annual report.

John T. Breggar, who has been engaged in the cereal disease survey, especially for stripe rust, in the Pacific Northwest under the direction of Prof. Charles E. Owens of the Oregon Agricultural Experiment Station, has completed his work and resigned effective December 8.

J. C. Brinsmade, Jr., scientific assistant in flax investigations, returned to Washington December 9 from the Northern Great Plains Field Station, Mandan, N. Dak., where he conducted investigations with flax during the spring and summer.

Glenn W. Carey, who has assisted in the barberry eradication campaign in Michigan during the past several months, has resigned effective December 15.

F. A. Coffman, scientific assistant in charge of cereal investigations on the Akron Field Station, Akron, Colo., arrived in Washington December 1, to consult with crop specialists regarding cereal experiments at Akron, and to prepare his annual report.

Miss Ruth Colvin, scientific assistant in cereal smut investigations, returned December 8 from a three weeks' vacation spent at her home in Flora, Ind.

Lester Eliff, who was chief petty officer in the U. S. Navy for two years during and following the war, was appointed a typist in the Office on October 20. During the war he made many trips between the United States and France on the U. S. S. Pastores, which transported troops to and from Europe.

Miss Ethel I. Elsbury, stenographer in eastern wheat investigations since June 9, resigned on December 4, to return to her home at Plymouth, Ill.

Prof. Edward S. Gaines, cerealist and plant breeder of the Washington Agricultural Experiment Station, has been appointed agent in the Office of Cereal Investigations, effective December 1, to conduct cooperative experiments in the breeding of disease-resistant cereals with special reference to smut resistant of wheat.

Henry C. Gilbert, assistant state leader of the barberry eradication campaign in South Dakota, arrived in Washington on November 24 for conference on the results accomplished this year and plans for future campaign. He left Washington on December 5 enroute to St. Paul for conference with Mr. McCarty and the other officers of the Minnesota eradication campaign and will return to Brookings about December 9.

James Godkin, of Madison, Wisc., who represented the cereal disease control investigations of the Office at the International Livestock, Grain, and Hay Show in Chicago from November 29 to December 6, reports that keen interest was shown in the exhibit by the many visitors at the show, and that a great variety of questions were asked regarding cereal diseases and their control. During the exhibit Mr. Godkin talked with 16 county agents from 9 States on various phases of control methods. Careful daily estimates indicate that during the show he discussed cereal diseases and control methods with nearly 2,500 people, the maximum number in any one day being 572 on December 4.

Dorr D. Green, who has been engaged on the takeall and flag smut project during the summer and fall, has resigned, effective November 30.

Lucie C. Joyer, who was transferred from the department to field service in the summer and has since been employed as clerical assistant to Dr. A. G. Johnson at Madison, Wisc., resigned October 27, and is now Mrs. Leighton of Elk River, Minn.

Dr. F. L. Kempton, pathologist in charge of barberry eradication, was on leave from December 3 to 9, during which time he attended to business affairs in eastern Indiana.

Dr. C. A. Ludwig, who has been in charge of epidemiology studies of black rust in the Southeast district during the past year, with headquarters at Auburn, Ala., has resigned effective December 26. His address after December 16 will be Route 1, Brookville, Ind., until the New Year, when he begins his service as Instructor in Botany at Clemson College, S. C.

E. S. McFadden, scientific assistant in charge of cereal experiments on the Highmore Substation, Highmore, S. Dak., arrived in Washington December 1, to consult with crop specialists and to prepare his annual report on cooperative cereal investigations in South Dakota.

Ludwig S. Mayer, scientific assistant in corn investigations, left Washington December 1 for points in New Jersey, New York, and Connecticut, to supervise the selection and shelling of seed corn from corn-breeding experiments in those States. He returned to Washington December 13.

Miss M. Helena Pray, stenographer and typewriter in the Office since June 25, has resigned, effective December 15.

R. W. Smith, scientific assistant in charge of cereal investigations on the Dickinson, N. Dak., Substation, arrived in Washington December 2 to prepare his annual report on the cooperative cereal experiments at Dickinson and to consult with crop specialists. While en route to Washington, Mr. Smith consulted with agronomic workers at the North Dakota and Minnesota experiment stations.

Dr. E. C. Stakman, pathologist in charge of black stem rust epidemiology and overwintering studies, arrived in Washington on December 15 for a conference regarding future work. While en route here from his headquarters at St. Paul, Minn., he consulted with pathologists at the Michigan Agricultural Experiment Station, East Lansing, Mich., Cornell University, Agricultural Experiment Station, Ithaca, N. Y.; and the Ontario Agricultural College, Guelph, Ont.

Fred J. Stevenson, formerly an employee of this Office, engaged in smut investigations in the Pacific Northwest and now assistant in farm crops, has been appointed an agent, effective December 1, to assist Professor Gaines in the breeding of smut-resistant cereals.

A. F. Swanson, scientific assistant in charge of cereal experiments at the Fort Hays Experiment Station, Hays, Kans., arrived in Washington December 1 to consult with crop specialists and to prepare his annual report on cereal experiments at Hays. While en route to Washington Mr. Swanson consulted with the specialists in farm crops at the Kansas Agricultural Experiment Station.

VISITORS

Dr. Duncan Starr Johnson, head of the department of botany of Johns Hopkins University, Baltimore, visited the Office on December 12 to discuss matters pertaining to cereal diseases.

Dr. L. R. Jones, pathologist of the Wisconsin Agricultural Experiment Station, Madison, Wisc., arrived in Washington December 5. He addressed the Phytopathological Seminar that afternoon on the subject of soil temperatures in their relation to the control of plant diseases. The lecture was illustrated by lantern slides.

Dr. Harold Lloyd Lyon, pathologist for the Hawaiian Sugar Planters' Association, called at the Office December 5 for the purpose of discussing matters of plant pathologic interest.

FIELD STATION CONDITION AND PROGRESS

HUMID EASTERN STATES (South to North)

LOUISIANA

Crowley Rice Station, Crowley (J. Mitchell Jenkins). No report.

GEORGIA

State Experiment Station, Athens, and Substations (R. B. Child). No report.

TENNESSEE

State Experiment Station, Knoxville, and Substations (C. A. Mooers). The rust nursery is growing well. Inoculations of oats and wheat are being made to study the overwintering of the rusts. Culturing of corn root-rot Fusaria from different parts of the State has been started.

NORTH CAROLINA

State Experiment Station, West Raleigh, and Substations (G. M. Garren). The first two seedings with oats in the cooperative experimental work on the Piedmont Branch Experiment Station were made September 1 and 15, one month earlier than in the two preceding years. These two seedings were seriously affected with leaf rust, the rust infection being greatest in the thicker stands. The oats were sown at the rates of 30, 60, 90, and 120 pounds per acre. The seedings of October 1 and October 15 were free from rust and the seedings of October 15 were far more vigorous and thrifty than any of the previous ones. The more vigorous growth of the later seeding is due largely to the fact that the first rain sufficient to put the land in condition for crop growth fell October 12. The month of September had been exceedingly dry, the

driest on record, and very warm.

The first seedings of oats on the Coastal Plains Branch Experiment Station were made September 14, two weeks earlier than in former years. The seedings for the first two dates were also seriously affected with leaf rust. The same weather conditions prevailed here as on the Piedmont farm. The effect of weather conditions on rust infection can be determined only by further observations. All the facts and specimen plants were submitted to the Plant Pathologist of the experiment station for definite and accurate information on the subject. He states that many local problems of grain rusts have yet to be solved, the chief one of which is the discovery of the host plant for the oversummering of the rust affecting the small grains. The host plant can not be volunteer oats or wheat, for volunteer grain does not grow during four or five months of the hot summer. It is planned thru the cooperation of the plant pathologist to do something towards solving the local rust problems the coming season.

VIRGINIA

Arlington Farm, Rosslyn (J. W. Taylor). Weather conditions continue favorable. The maximum temperature for the week of November 17--23 was 66°, with a minimum of 25°. From November 24 to 30 the maximum temperature recorded was 68°, and the minimum 28°. The total rainfall for the period from November 17 to November 30, inclusive, was 0.66 inch.

During the months of September and October, 223 fortieth-acre plats were sown to wheat, 62 to oats, 61 to barley, and 6 to spelt and emmer. In addition, 23 twentieth-acre plats were sown to rye.

NEW YORK

Cornell University Experiment Station, Ithaca (H. H. Love). The first seeding of the wheat varieties to be used in cross has been made in the greenhouse and the plants are now making good growth. A number of first and second generation hybrids also were sown, and in general the germination is very good. Notes are now being taken on the wheat hybrids which were grown this past year, and also on a rather extensive lot of hybrids between hulled and naked oats.

The weather has turned cold, and as the ground is frozen fall seeding has ceased growth. The fall hasbeen such, however, that practically all fall seeding is going into the winter in splendid condition.

INDIANA

Indiana Agricultural Experiment Station, La Fayette (George M. Hoffer). The work in the corn root and stalk rot investigations during the month of November consisted primarily in studying data recorded during the summer in the experimental plot work. Ira C. Hoffman has returned to his permanent station at LaFayette, Ind. Glenn M. Smith has visited his cooperators, the Leonard Seed Co., Chicago, Ill., and the Jerome B. Rice Seed Co., Grass Lake, Mich., during the month and made tentative plans for next year's work.

Greenhouse experiments are in progress to study some of the factors affecting the germination of corn. The effects of fertilizers and soil reaction on healthy and diseased corn seedlings are to be especially noted.

ILLINOIS

Cooperative Corn Rot Investigations, Bloomington (J. R. Holbert). On November 19 and 20 J. R. Holbert and LeRoy Compton washed out roots of ninety Turkey wheat plants. These plants represented samples grown from high grade Bloomington-grown wheat, high grade Kansas wheat, selected scabbed heads of wheat, and heavy and light screenings of scabbed wheat. The plants were studied from the standpoint of length and distribution of roots, number of culms, length and number of blades, root rotting, and blighting of plants. The plants represented sowings made on September 27, October 8, and October 18 Plant photographs were taken. In the spring, similar studies will again be made.

During the progress of the corn harvesting this fall, Messrs. Holbert and Biggar have dug up, examined, and taken full notes on the condition of the roots of about 2,500 corn plants. At the same time, longitudinal sections were made of the stalks and the stalk interior thoroughly described. Considerable variation was found in both roots and stalks. As most of these plants were used in growth studies, and as a record has been obtained of the production of each stalk, it will be possible to correlate production and seasonal growth with root and stalk condition. Much material was obtained for the study of bacterial diseases of corn as well as for the study of the rot organisms.

The oil paintings representing various disease symptoms of corn plants attacked by Fusarium rots, made during the season by Miss Marie Stevick, have been sent to the University of Wisconsin, where lantern slides will be made from them. The slides will then be hand colored by Miss Stevick and will constitute a very interesting and valuable addition to our equipment. They will be especially valuable for lectures.

During the past season, plant growth records have been taken on about 12,000 corn plants, representing field and sweet corn types. In connection with the growth records, detailed notes were taken of disease indications on the plants. The measurements and notes, taken from time to time, gave the opportunity to watch the development of disease symptoms.

In cooperation with Professor L. E. Melchers of the Kansas Agricultural Experiment Station, a study was made of corn smut and root rot in corn selections of Commercial White at Manhattan, Kans. Growth records and disease notes were taken on 9,000 plants during the season and much valuable data obtained. Ivan White, of the Office of Cereal Investigations, now a senior student at Manhattan, took most of the summer notes on this plot.

During the latter part of October, Mr. Biggar accompanied Charles Pendarvis, Agronomist for the Lewis Seed Company of Media, Ill., to Yarmouth, Iowa, where a corn-breeding demonstration was held on the farm of Mr. Ray Redfern. Considerable root rot and stalk rot was found in that vicinity, a field of popcorn being especially badly infected. Both men gave talks on the disease, using infected roots for illustrations. Mr. Pendarvis is cooperating with this office in corn disease investigation.

The Bloomington Canning Company, who grow about 6,000 acres of sweet corn in the vicinity of Bloomington, cooperated with this Office in a study of sweet

corn disease. Four plots of sweet corn were planted, representing different selections from the standpoint of stalk selection and germinator selection. Field weights were taken at the time the corn was ready for canning. On one plot the canning company made a cutting test of the various selections so that the weight of the cut corn was secured. Mr. Roy Bishop, agronomist for the company, assisted very much in this experiment.

Sample ears of forty different varieties of corn grown on one of the plots here, representing dent, flour, and flint types, were recently sent to Prof. John Pieper of the University of Illinois. Professor Pieper plans to use these samples for class room work and for demonstration.

Dwight F. Bracken, who has been assisting with the wheat scab and the corn root rot experiments during the summer, is now a junior in the University of Illinois.

J. R. Holbert spent November 24 and 25 at LaFayette, Ind., conferring with the experiment station men there.

Visitors to the Office during the past two weeks were C. R. Ball, Dr. A. G. Johnson, Dr. G. N. Hoffer, and F. D. Richey of the Office of Cereal Investigations; Professor Nichols of Lexington, Ky; Professor R. C. Clark of Mount Morris, Ill.; and County Agent Rehling from Clinton County, Illinois.

Professor John Coulter was a visitor to the office on November 24. He has been in charge of vegetable gardening among German prisoners and convalescents in France, during the war. He again sailed for France on November 26, 1919, to continue agricultural work for the French Government.

WISCONSIN

Agricultural Experiment Station, Madison (J. G. Dickson). No report.

MISSOURI

State Experiment Station, Columbia (L. J. Stadler). No report.

IOWA

Agricultural Experiment Station, Ames (L. C. Burnett). No report.

GREAT PLAINS AREA (South to North).

TEXAS

Amarillo Cereal Field Station, Amarillo (John F. Ross). The weather data for the month of November is as follows: Maximum temperature, 77° on the 24th; minimum, 6° on the 27th and 28th; average hourly wind velocity, 6.1 miles; precipitation, 1.16 inches.

The month has been rather cold, with many rainy and foggy days, making field work nearly impossible. Most of the fall grains were sown October 31 to November 3. The nursery rod rows were sown on November 14 and 15. The

late date-of-seeding plats were also sown on the 15th. All these sowings except the latest have emerged rather unevenly, but with fairly good stands. Plants are still emerging on most of the plats.

The D.L.A. and F.C.I. sorgos were weighed and hauled in, but thrashing of the grain sorghums was stopped by unfavorable weather soon after it was started.

Mr. Glen Briggs of the Guam experiment station visited the station on the 24th.

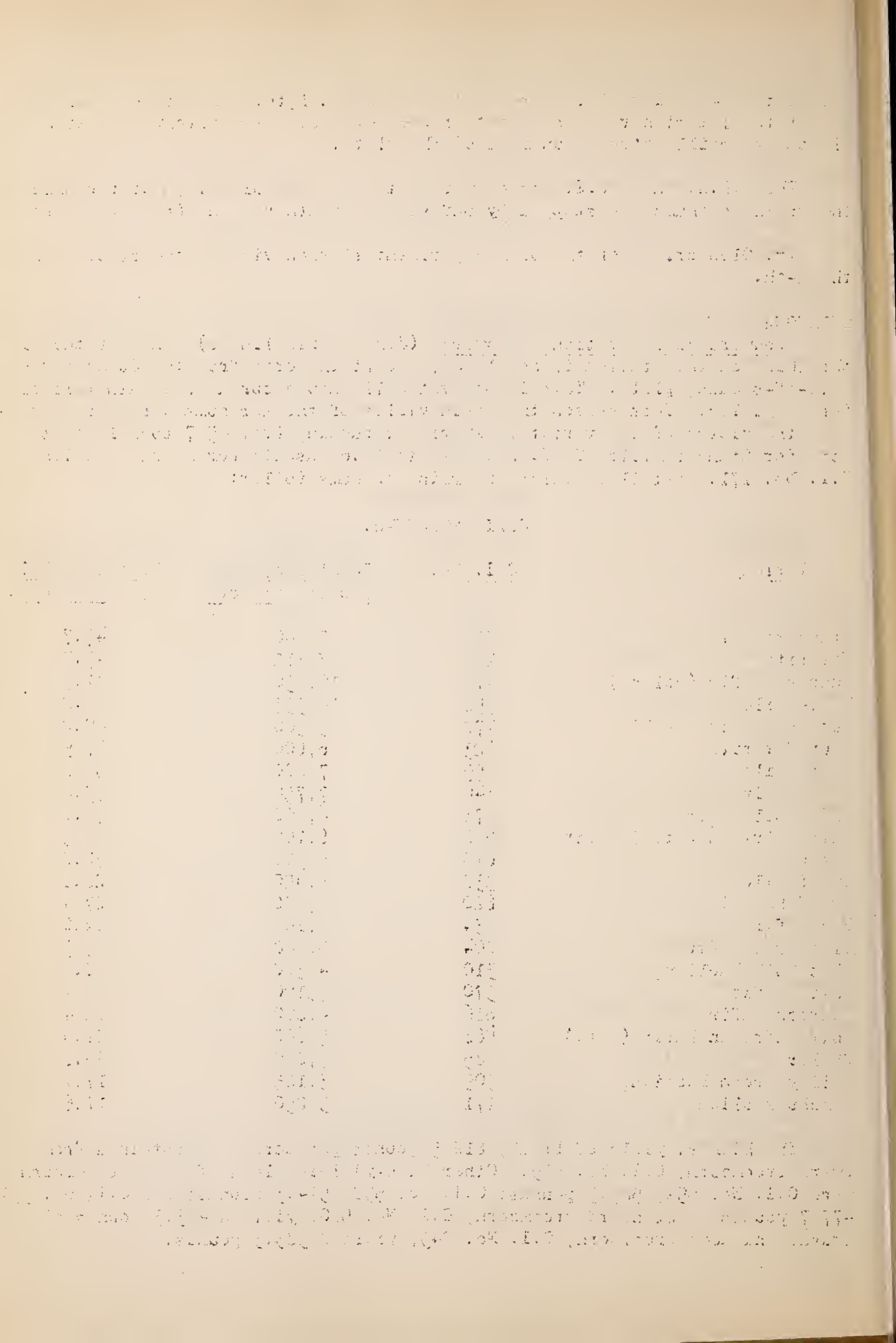
OKLAHOMA

Woodward Field Station, Woodward (John B. Sieglinger). All of the plat thrashing on the station is completed, except the crop from the Sumac sorgo date-of-seeding plats. This is not yet well enough cured to obtain reliable forage yields. This season the grain yields of the sorghums were above average, the yields of the varietal experiment running from 45.7 bushels to the acre for Standard milo, C. I. No. 234, to 17.6 bushels for Manchu kaoliang, C.I. No. 171. Detailed yields of grain sorghums follow:

GRAIN SORGHUMS.

Variety	C.I. No.	Total crop, pounds per acre.	Grain, bushels per acre.
Standard milo	234	9,500	45.7
Feterita	182	7,312	43.7
Sunrise kafir (select)	472	10,350	41.9
White milo	352	10,333	41.2
Sunrise kafir (bulk)	472	9,900	40.0
Spur feterita	623	6,600	37.9
Dwarf milo	359	7,200	37.2
Dawn kafir	340	7,750	33.8
Blackhull kafir	71	6,600	33.0
White African (Std.) kafir	566	6,700	32.3
Darso	615	5,300	30.2
Dwarf milo	332	5,450	28.6
Iwarf hegari	620	5,850	27.4
Red kafir	34	5,100	24.0
Blackhull kafir	204	5,500	23.3
Blackhull kaoliang	310	4,300	22.8
White kafir	370	5,100	22.7
Schrock kafir	616	4,800	22.4
White African kafir (Dwf.)	566	5,600	21.0
Shallu	85	3,850	20.8
Valley Brown kaoliang	309	3,125	17.7
Manchu kaoliang	171	3,250	17.6

The highest yield of brush, 612.5 pounds per acre, was obtained from Iwarf broomcorn, C.I. No. 559. Other high-yielding lots of Iwarf broomcorn were C.I. No. 599, 583.3 pounds; C.I. No. 598, 514.3 pounds; and C.I. No. 597, 477.7 pounds. Standard broomcorn, C.I. No. 580, yielded 483.3 pounds of brush, and Acme broomcorn, C.I. No. 243, yielded 383.3 pounds.



The maximum temperature for the month was 75°, on November 24, and the minimum was 11°, on the 26th and 27th. The precipitation for the month was: November 9, 1.40 in.; November 10, 0.10 in.; November 27, 0.71 in.; and November 29, 0.16 in. (snow); a total of 2.37 inches. Snow has been on the ground since the 29th. Coal is scarce and none can be bought from dealers.

KANSAS

Fort Hays Branch Station, Hays (A. F. Swanson). The rate-and-date-of-seeding experiment with wheat, seeding of which was begun September 8 and continued at weekly intervals, was completed November 19. The seedings in November were made in ground partly thawed out after being frozen to the depth of 3 inches. The last seeding was followed by 6 inches of snow.

All wheat in the vicinity of Hays and in northwestern Kansas will go into the winter in excellent condition. The soil has an abundance of moisture and the wheat is well rooted and tillered.

State Experiment Station, Manhattan (John H. Parker). No report.

COLORADO

Akron Experiment Farm, Akron (F. A. Coffman). Weather conditions have been very favorable for winter grains during the past month. Over an inch of precipitation was recorded at the Akron Field Station during November. The weather, while favorable for winter grain, has been extremely unpleasant, being cold and windy. The ground has been covered with snow for nearly three weeks, and in places the snow remains in drifts several feet in depth, although no snow has fallen for almost two weeks.

Cereal work at the Akron Field Station has progressed favorably during the month. The corn ear-row experiment was harvested November 5 and 6. The yields for the different rows were very poor, due to the dry season. Fall stand data on both nursery and field projects was completed November 23. Excellent stands have resulted from practically all of our fall seedings. Staking of the fall grain nursery was completed November 24.

The minimum temperature for the month was -9° F., recorded November 12.

WYOMING

Cheyenne Experiment Farm, Cheyenne (A. L. Nelson). The month of November has been almost continuously cold, especially the past two weeks. For three consecutive days the maximum temperature remained below zero. The minimum temperature for four consecutive days was -5, -10, -12, and -10°. These temperatures were accompanied by snow. As yet, only light winds have occurred and the snow drifted but little, hence the fall wheat was covered during the coldest weather. However, the sunshine on November 30 removed practically all snow from the wheat. The precipitation for the month was 0.96 inch.

Wheat in dates-of-seeding experiments sown October 15 and November 1 has sprouted.

The plastering of the bunk house was delayed, due to the lack of lath in Cheyenne. The lathing has now been completed, but the cold weather has prevented plastering.

All fall work is finished and the regular winter program is under way. This consists of repair work, cleaning barn yards, and protecting animals from the winter weather.

The following are the yields of wheat grown in 1919. The dry growing season, and the rust, hail, and wind gave sufficient opportunity for a thorough test of the varieties. The fall-sown wheats escaped damage from rust, hail, and wind.

FALL WHEATS

Variety	C.I. No.	Yield per acre.	Variety	C.I. No.	Yield per acre
Kanred	5146	7.47	Alberta Red	2979	5.42
Armavir	1355-2-2	6.84	Beloglina	1543	5.00
Kharkov	1442	6.50	Crimean	1437	4.98
Turkey	1571	6.25	Crimean	1559	4.68
Diehl Mediterranean	1359	5.96	Crimean	1432	4.44
Ghirka	1438	5.77	Kharkov	1583	4.16
Turkey	2998	5.44	Crimean	1532	4.04
Malakoff	2908	5.44	Buffum No. 17.	3330	2.98

COMMON SPRING WHEATS

Erivan	2397	5.16	Prelude	4323	1.58
Norka	4377	4.21	Ruby	6047	1.33
Galgalos	2398	3.92	Marquis	3641	1.27
Kitchener	4800	2.83	Power	3697	1.08
Preston	3081	2.75	Ghirka	1517	.98
Converse	4141	2.41	Haynes	2874	.76
Huron	4935	2.16	Glynden	2873	.60
Pioneer	4324	1.79	Rysting	3022	.58
Laramie	6233	1.66			

DURUM WHEATS

Acme	5284	7.29	Arnautka	1493	5.33
Monad	3320	6.33	Marouani	1593	5.21
Peliss	1584	6.25	Kubanka	4063	4.79
Buford	5295	5.71	*N. Dak. No. 5.	3322	4.46
Kubanka	1516	5.58	Arnautka	4064	4.33
Golden Ball	6227	5.50	Beloturka	1520	4.04
Kubanka	1440	5.33	Mindum	5296	4.04

*Severely damaged by hail.

The yields are the averages from four fortieth-acre plats. Two plats of each variety of fall wheat were seeded on disked oat stubble and two on fallow. The average yield of all varieties seeded on oat stubble is 1.94 bushels per acre, while the average of that seeded on fallow is 8.67 bushels. Two plats of each variety of spring wheat were seeded on fallow and two on double-disked corn stubble. The average yield of all varieties of durum wheats on fallow was 5.96 bushels per acre, while that seeded on disked corn stubble was 4.61 bushels.

Sheridan Field Station, Sheridan (Leroy D. Willey). No report.

SOUTH DAKOTA

Bellefourche Experiment Farm, Newell (A. D. Ellison). The weather for the month of November has been marked by freezing temperatures and much wind. The maximum temperature for the month was 49° on the 23d and 24th; minimum, -7° on the 28th; precipitation, 1.22 inches, practically all in the form of snow. The total precipitation for the year to date is 13.63 inches.

Reports from farmers on the project who made cooperative trials with spring cereals during the past season, show that in many instances profitable yields were obtained. The maximum acre yield obtained from Swedish Select oats, C. I. No. 134, was 72 bushels; Kubanka wheat, C. I. No. 1440, 20 bushels; Trebi barley, C. I. No. 936, 80 bushels; Chevalier barley, C. I. No. 530, 30 bushels.

On account of the early winter many sheep and cattle have been brought in from the range to be either sold or fed. The shipments have been slow in moving, as the car situation has been bad for some time. This fact has necessitated longer feeding of stock intended for shipment, which has helped to increase the hay shortage throughout the project.

Cottonwood Substation, Cottonwood (Manley Champlin). No report.

Vivian Substation, Vivian (Manley Champlin). No report.

Eureka Substation, Eureka (Manley Champlin). No report.

Highmore Substation, Highmore (E. S. McFadden). No report.

State Experiment Station, Brookings (Manley Champlin). No report.

NORTH DAKOTA

State Experiment Station, Agricultural College, Fargo (W. E. Brentzel). The field work in connection with flax wilt and canker at Fargo and Mandan has been completed. Extensive studies are now being conducted in the laboratory and greenhouse. Several hundred isolations of fungi have been made and the organisms secured are being used for inoculations in the greenhouse.

Northern Great Plains Field Station, Mandan (J. C. Brinsmade, Jr.). No report.

Dickinson Substation (Ralph W. Smith). No report.

MONTANA

Judith Basin Substation, Moccasin (Ralph W. May). The precipitation for November was 0.93 inch, which is 0.28 inch above the average of the past 22 years. Practically all of the precipitation was in the form of snow. Nearly half of it fell during the last five days of the month.

The lowest temperature recorded for the month was -17°, on November 26. The temperature has been below zero seven days during the month, five of which were during the last week. From November 15 to 25 the weather was good. All

the snow that had fallen previously melted and during the latter part of the 10-day period the ground was sufficiently dry to take notes in the field. Stand counts were made on the cultural experiments with wheat to prevent winterkilling. The wheat has not been injured by the low temperatures of the past week, as it is covered with about a foot of snow.

Samples of twelve varieties of wheat have been sent to Washington for milling and baking tests.

WESTERN BASIN AND COAST AREAS
(South to North and West).

UTAH

Nephi Substation, Nephi (Aaron F. Tracken). The unusually cold weather which prevailed during October continued until November 10. From November 10 to 25 the nights were cold but during the day temperatures ranged as high as 65° to 87°. Fall wheat which did not emerge in October came through with good stands in November. On the night of November 25, 4 inches of snow fell and snow continued to fall thereafter until at the end of the month the ground, which is not frozen, was covered to a depth of 8 inches. Wheat in this section has never gone into the winter under more favorable conditions. The minimum temperature for November was 7°, and the precipitation, all of which came as snow, amounted to 0.69 inch.

The field work on the Station was finished November 18. The last two days were spent in putting up a large sign 24 feet long by 8 feet wide. The sign reads as follows: "EXPERIMENTAL DRY FARM, UTAH EXPERIMENT STATION AND U. S. DEPARTMENT OF AGRICULTURE COOPERATING, NEPHI, UTAH."

IDAHO

Aberdeen Substation, Aberdeen (L. C. Aicher). No report.

OREGON

Harney Branch Station, Burns (Obil Shattuck). Weather conditions for the last half of November have forced a discontinuance of fall plowing and seeding. The ground froze to a depth of 6 inches and is now covered with snow. Storing machinery and wood hauling have occupied the greater part of the past two weeks.

A total of 300 head rows were seeded in the fall wheat nursery.

The maximum temperature for November was 58° on the 16th; minimum, -5° on the 27th. The total precipitation was 0.77 inch. On the 26th, the wind velocity was 16.5 miles per hour for 24 hours with the thermometer standing at 12° above zero, the wind being from the northwest.

Sherman Co. Branch Station, Moro (D. E. Stephens). No report.

WASHINGTON

Adams Branch Station, Lind (M. A. McCall). No report.

CALIFORNIA

Rice Field Station, Biggs (J. W. Jones). No report.

Agricultural Experiment Station, Berkeley (W. W. Mackie). No report.

Plant Introduction Station, Chico (V. H. Florell). The prolonged drought was broken by a rain of 0.67 inch, which began falling on November 29. There was additional precipitation the night of November 30, with indication of more to follow. The total precipitation was about 1 inch. Although more moisture is needed, there has been sufficient to insure prompt germination of the cereals that have been sown.

The wheat classification nursery was sown November 29. All sowings have now been made except the foreign nursery wheats, this year's hybrids, and the increase Hard Federation and White Federation wheats. These sowings will be completed as quickly as the weather permits.

The fourth sowing of Doctor Harlan's barleys was made today. The sowing of fifteen days ago is just emerging.

Dr. K. F. Kellerman, Dr. O. F. Cook, and Mr. W. T. Swingle of Washington, D. C., and Mr. W. W. Mackie of Berkeley, Cal., were visitors at the Plant Introduction Garden during the past week.

o-o-o-o-o-o-o-o-o-o-o

17

JAN 20 1920
BUREAU OF PLANT INDUSTRY

C E R E A L C O U R I E R

Official Messenger of the Office of Cereal Investigations,
Bureau of Plant Industry, U. S. Dept. of Agriculture,
(NOT FOR PUBLICATION)

- -

Vol. 11. December 31, 1919. No. 26.
Personnel and Project Issue.

- -

PERSONNEL ITEMS.

C. P. Ashton, who has been property clerk of the Office during the past several months, was transferred, effective January 1, to a position with the Vocational Education Board.

W. H. Ballamy, who has been assistant to Mr. Kirby in epidemiology and over-wintering studies of black rust in the south-central district, has resigned, effective December 31.

Mrs. E. G. Berglund, who has been assisting J. A. Clark in the tabulation of data on the distribution of wheat varieties, has completed her work and resigned, effective December 27.

H. H. Biggar, who has been in Washington since early in December preparing material for a paper on the correlation of early growth, variation, and productivity of maize as influenced by certain pathologic factors, left for his headquarters at Bloomington, Ill., on December 23.

Galley proof of Farmers' Bulletin 1092, "Prairie Rice Culture in the United States," by Charles E. Chambliss, was read on December 18.

L. S. Cheney, in charge of epidemiology and over-wintering investigations of black rust in the north-central-east district, has resigned, effective December 31, and returned to his home at Barron, Wis.

Warren N. Christopher, assistant to Mr. Thiel in the study of epidemiology and over-wintering of black rust in the north-central-west district,

has resigned effective December 31.

Miss Ruth Colvin, who has been engaged for the past several months in identifying material collected by the men engaged in cereal disease survey and other pathologic investigations of the Office, was transferred to the Office of Fruit Disease Investigations at the end of 1919.

Lester E. Eliff, member of the clerical staff for the past few months, has been transferred to the Bureau of Chemistry with the beginning of the new year.

Miss Grace O. Furrow, who has been assisting Mr. Leukel in the investigation of methods of infection of cereal plants by the eelworm or nematode, was transferred to the Editorial Division of States Relations Service, effective December 31.

H. B. Harris, who has been engaged in the barberry eradication campaign in Wyoming, resigned on December 26 and has returned to his home at Steele City, Nebr.

Charles R. Hursh, who has been assisting Dr. W. W. Mackie in the investigation of black rust in California, has resigned effective December 31.

Edwin J. Kepler, who has been engaged in the barberry eradication campaign in Ohio, resigned on December 31.

E. D. Longnecker, who has been engaged in the barberry eradication campaign in Michigan, resigned on December 23.

Charles McIntyre, who has been engaged in the barberry eradication campaign in Ohio, has resigned effective December 31.

Miss Hallie Marvin, who has been engaged in the study of life history of the nematode or eelworm affecting wheat, was transferred on December 31 to the Office of Grain Standardization of the Bureau of Markets.

Creighton F. Murphy, during the past year assistant to Mr. Krakover in the study of epidemiology and overwintering of black rust in the northeast district, has resigned effective December 31, and returned to his home at Crafton, Penn.

Miss Alpha E. Myers, who has been assisting Dr. Harlan in the tabulatio. of results of genetic and breeding studies, has been granted 3 months furlough, from January to March, inclusive, and will accompany her mother to California for the remainder of the winter season.

Alden A. Potter, for several years engaged in investigation of the smuts of corn and sorghums and more recently superintending the planning and construction of the control greenhouse at Arlington Farm, has resigned effective December 31, to accept a position in the Bureau of the Census.

David J. Shaich, who has been helping in the greenhouse investigation of rusts at the University of Minnesota, has resigned effective December 31.

E. C. Stakman, pathologist in charge of black stem rust epidemiology and overwintering studies, discussed the "Relation of Black Stem Rust and the Barberry" before the scientific staff of the Office on December 18. Dr. Stakman's discussion was illustrated with a large number of lantern slides. He left for his headquarters at St. Paul, Minn., on the evening of December 18 after a 3-day conference here regarding rust investigations.

Miss Marie E. Stevick, who has been engaged in preparing illustrations showing the effect of the Fusarium root rots of corn plants, under the direction of Mr. J. R. Holbert at Bloomington, Ill., resigned on December 4.

Duane E. Walrath, who has been engaged in the barberry eradication campaign in Nebraska, resigned on December 20.

A manuscript entitled "Fall-sown Oats," by C. W. Warburton and T. R. Stanton, was submitted to the Chief of the Bureau on December 23 for publication as a Farmers' Bulletin. This is to replace Farmers' Bulletin 436, "Winter Oats for the South."

A. G. Weidemann, who has been engaged in the barberry eradication campaign in Michigan, resigned on December 24.

Miss Jessie I. Wood, who has been detailed to the Office of Plant Disease Survey to help in tabulating results of the cereal disease survey conducted during the past season, has completed her work and transferred at the end of the year to the Extension Division of the States Relation Service.

VISITORS

Dr. F. P. Buzzell, of the Department of Plant Breeding, Cornell University, was in Washington during the latter part of December and called several times at the Office. He conferred with various members of the Office staff, particularly with reference to varietal experiments with corn.

F. W. Clark, who was an assistant in the rice investigations conducted by the Office in South Carolina several years ago, was a caller at the Office on December 22. Mr. Clark is now engaged in farming and ranching at Pierce, Tex.

Viggo Lund, who is in charge of sugar beet investigations for the Maribo Sugar Factory, Maribo, Denmark, was a caller at the Office on December 30. During 1917 and 1918 Mr. Lund was engaged in post-graduate study at Iowa State College and at Cornell University.

218-A. INVESTIGATIONS OF IMPERFECT AND SAC FUNGI.

(Dr. A. G. Johnson, Pathologist in Charge).

WHEAT-GALL DISEASE INVESTIGATIONS (R. W. Leukel).

The fence surrounding the wheat-gall disease plot at Arlington Farm is nearing completion; its construction is being immediately supervised by Assistant Superintendent Criswell. The wire cages to cover the cylinders have been finished and placed in position.

The cylinders in which galls were placed at various depths and wheat sown have shown that the nematodes are able to infect the seedlings even when buried to a depth of 12 inches below the surface. This experiment is being tried at present in a cold frame near Doctor True's Greenhouse and will be repeated again in the spring in the field.

Barley, which was believed to be entirely immune to gall injury, has been found infected. Seedlings of Hansee hulless barley which showed marked characteristic symptoms of nematode injury were examined under the binocular dissecting microscope and swarms of larvae found about the growing point. This was found only in the case of this one variety. Infected seedlings will be tagged for future observation.

Larvae kept in distilled water in the laboratory since August 8 and observed weekly are still alive, demonstrating the hardiness of the organisms.

Galls were ground up on October 20 so as to approximate conditions found in ground feed. It has been found that the larvae remain alive and become active after being placed in water. This seems to show that it is not advisable to feed ground screenings to stock, provided digestion does not kill them.

Data so far obtained indicate that both Kanred and Marquis wheat are relatively resistant to nematode infection. It is hoped that the work now in progress will more definitely establish this fact.

MIDGE INJURY TO WHEAT CONFUSED WITH SCAB.

Dr. C. E. Leighty, agronomist in charge of eastern wheat investigations, called attention to the fact that men in the grain trade have been referring to the injury done to kernels of wheat by the midge (probably *Diplosis tritici*, Kby, or possibly a closely related species) as "scab." These kernels have a scar on the back and are always more or less deformed. The appearance of the scar has probably resulted in the use of the word "scab" to designate this condition. Such kernels may or may not have been produced on plants affected by the disease to which we apply the name "scab."

The midge has become very prevalent in the Eastern States within the last few years, and, in many sections, a considerable portion of the wheat grains is injured by them. Until recently this insect has scarcely been noticed since about 50 years ago, when it was very destructive in Eastern States, causing many wheat growers to quit raising the crop. The insects apparently hatch from eggs deposited within the crevices of the wheat head about the time of blooming. They make the growth coincident with that of the wheat kernels on which they live, sucking the juices stored up in the kernels through an aperture in the back of the kernel. This results in a scar and in a failure to develop properly.

218-B. INVESTIGATIONS OF RUSTS.

(Dr. H. B. Humphrey, Pathologist in Charge.)

NURSERY, LABORATORY, AND GREENHOUSE STUDIES ON THE STEM AND LEAF RUSTS OF WHEAT AT THE KANSAS STATION (L. E. MELCHERS).

Since 1913, estensive nursery and greenhouse experiments have been conducted at the Kansas Station, in which about 300 varieties of spring and winter wheats have been studied to learn their behavior to stem and leaf rusts. In 1918, publications appeared showing that three winter wheat varieties (Kanred, P1066, and P1068) showed marked resistance to stem rust, Puccinia graminis tritici, in the field and greenhouse. Field experiments have been conducted for three years using this rust to produce an epidemic. The results of two years work in which Puccinia graminis tritici-inficiens, was used to produce an artificial epidemic have been obtained.

A study is being made of the rusts occurring on wheat and grasses in Kansas and adjoining States. These rusts are being cultured in the greenhouse and their behavior on different varieties of wheat determined. There is evidence that numerous strains of stem rust occur in Kansas.

A study is being made of the inheritance of the disease-resistant character. Varieties of winter (Kanred) and spring (Marquis) wheat have been crossed and the F1, F2 and subsequent generations are being studied from the standpoint of rust behavior. Genetic studies are also being made of the winter and spring habit as well as of morphologic and agronomic characters.

Morphologic, cytologic, and physiologic studies of the possible causes of rust resistance are being investigated. It has been found that the three varieties which show resistance, Kanred, (P762, C.I. No. 5146) P1066 (C.I. No. 5879), and P1068 (C.I. No. 5880), when inoculated with certain strains of rust, show an entirely different reaction when inoculated with other strains of rust. This problem is being investigated from a morphologic, cytologic, and physiologic point of view, and these varieties are being compared with susceptible ones. In connection with these studies, investigations are under way which deal with the influence of temperature and light upon germination of uredinio-

spores. The effect of humidity on germination and infection is also being studied.

The Department of Milling Industry is conducting milling and baking experiments to determine the milling value of the rust-resistant wheat varieties and hybrids.

A grassplot has been planted at Manhattan and it is expected that all varieties of grasses susceptible to Puccinia graminis will be grown in this plot. An effort is being made to collect, from all parts of the State the grasses which harbor Puccinia graminis. A survey of their prevalence and distribution also is being made. Physiologic studies are in progress to determine the conditions aiding and inhibiting the germination of grass seeds.

218-D. SMUT INVESTIGATIONS.

(George M. Reed, Pathologist in Charge.)

CEREAL SMUT SURVEY.

During the months of May, June, July, and August the field survey for the cereal diseases, particularly the smuts, was conducted in 26 States. The grain fields of farmers in certain counties in these States were visited shortly before the harvest and careful records taken regarding the prevalence of cereal diseases.

WHEAT SMUTS.

Table 1 indicates some of the results of the survey for bunt and loose smut of wheat. In the 26 States surveyed, 6,104 wheat fields were visited by the field assistants. These fields represent an approximate area of 485,507 acres.

Bunt

The percentage of bunt in the different States is somewhat lower than in 1918. The percentage of damage done to the 1919 crop does not appear to be nearly as great as in the preceding year. High percentages of bunt, however, were found in a number of fields. The worst cases reported were as follows:

One field in California showed 90 per cent; one in Washington, 80 per cent; one in Indiana, 76 per cent; one in Idaho, 66 per cent; one in Georgia, 60 per cent; and one in Ohio, 50 per cent.

Of the fields examined, 2,220 were sown with treated grain. Formaldehyde 1-40 was commonly used in the regions east of the Rockies, while in the Far West the copper sulphate treatment was more generally employed. The results

The results

indicate the marked effectiveness of seed treatment in the prevention of bunt. In a few individual cases, however, a particular farmer failed to obtain satisfactory control.

Loose Smut.

Loose smut of wheat was generally prevalent. It appears to be much more severe in the more southern and eastern section of the winter wheat belt. Generally, the amount of loose smut present in the field was small. High percentages, however, were found as follows: Ohio, 34 per cent; Illinois, Indiana, Maryland, and Texas, 20 per cent; Missouri, 18 per cent; Kansas and Kentucky, 15 per cent.

In Indiana, wheat treated by the hot-water method was sown by 107 farmers. Most of these farmers sowed a small plot with the treated seed, and used the untreated grain for the main seeding. The results indicate a very marked reduction in the amount of loose smut when the grain is treated by the hot-water method. The fields sown with treated seed average 0.3 per cent of loose smut, while the fields sown with untreated grain average 7.3 per cent.

A very marked increase in the practise of seed treatment is evident in 1918 as compared with 1917. In the sixteen States of Alabama, Arkansas, Georgia, Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, New York, North Dakota, Ohio, Oklahoma, Pennsylvania, and Texas, a comparison of results is possible. In 1918, the number of fields surveyed which were sown with untreated seed was 4,679, and the number sown with treated seed 541, indicating about 12 per cent of the fields sown with treated seed. In 1919, the number of fields surveyed which were sown with untreated seed was 2,609, and the number of fields sown with treated grain 617, or about 23 per cent.

Oat Smuts

Table 2 gives the important results obtained with reference to the smuts of oats. In the 20 States surveyed, 1,990 fields were examined. Of these, 456 were sown with treated grain. The results are very favorable to the seed treatment. In exceptional cases, however, the treatment methods failed to produce satisfactory results.

SPECIMENS IDENTIFIED.

The field assistants sent in a large number of specimens of various cereal diseases for determination. The identification of the parasites was made by Miss Ruth Colvin and Miss Florence M. Smith, who identified a total of 1,764 specimens. These were distributed as follows:

Wheat diseases	1,161
Oat diseases	295
Rye diseases	70
Barley diseases	176
Grass diseases	62

A total of 304 specimens of bunt were received; 174 of these proved to be Tilletia laevis, while the remaining 130 were Tilletia tritici. Specimens of Tilletia laevis were sent in from California, Oregon, and Washington. The specimens of T. tritici came mainly from the same States, but this species was also sent in from Colorado, Minnesota, Missouri, Montana, and Ohio.

Table 1.-- Data obtained in Cereal Disease Survey on bunt and loose smut of wheat in 1919.

State	Total No. of fields	Acreage	Bunt				LOOSE SMUT
			Treated Seed sown		Untreated Seed sown		
			No. of fields	Per cent bunt	No. of fields	Per cent bunt	Per cent in all fields surveyed.
Alabama	133	2,871	68	T.	65	1.3	0.3
Arkansas	12	212	9	0	3	7.6	1.8
California	593	180,614	264	2.5	329	2.0	T.
Colorado	154	5,962	68	T.	86	1.9	.3
Georgia	39	330	26	T.	13	6.0	.7
Idaho	283	11,642	155	1.7	128	4.7	.7
Illinois	92	2,562	2	0	90	.3	.8
Indiana	596	10,232	95	T.	501	.9	2.0
Iowa	214	3,653	7	T.	207	.5	.3
Kansas	114	6,500	21	T.	93	1.2	3.3
Kentucky	163	6,915	63	T.	100	.5	.8
Maryland	164	4,010	20	.3	144	.8	3.6
Minnesota	520	12,178	95	T.	425	.5	.4
Missouri	562	22,887	172	T.	390	1.6	1.5
Montana	97	3,517	14	0	83	.1	T.
Nebraska	67	3,324	17	.8	50	3.0	1.1
New York	138	1,747	4	0.	134	.4	.4
North Dakota	53	3,022	38	0.	15	0.	T.
Ohio	283	5,157	23	.3	260	2.1	2.0
Oklahoma	98	5,597	5	T.	93	.3	1.8
Pennsylvania	105	1,259	6	0	99	.2	.7
Tennessee	177	3,433	35	T.	142	.6	.8
Texas	200	16,160	29	T.	171	.02	1.3
Virginia	59	1,348	5	.2	54	.3	4.0
Washington	1,081	169,456	973	2.5	108	2.9	T.
Wisconsin	107	919	6	0.	101	t	T.
	6,104	485,507	2,220		3,884		

Table 2.-- Data obtained in Cereal Disease Survey on loose and cereal smuts of oats in 1919.

State	Total No. of fields	Acreage	Treated seed sown		Untreated seed sown	
			No. of fields	Per cent smut	No. of fields.	Per cent smut
Alabama	113	1,748	14	0.4	99	3.0
Arkansas	8	95	1	1.0	7	10.7
California	109	1,360	1	0.	108	0.
Colorado	20	229	5	.8	15	.7
Georgia	23	409	12	.5	11	7.3
Idaho	94	1,624	34	1.4	60	5.4
Illinois	31	532	4	.5	27	5.4
Indiana	254	4,065	72	.4	182	5.4
Iowa	78	1,688	13	.1	65	.8
Kansas	51	1,155	19	.9	32	11.6
Kentucky	14	118	1	0.	13	.5
Maryland	4	63	0	0.	4	7.5
Minnesota	280	4,865	48	.7	232	3.1
Missouri	101	1,718	26	.6	75	6.5
Montana	60	1,192	13	T.	47	.4
Nebraska	13	212	6	T.	7	3.8
New York	113	1,050	45	.8	68	4.8
North Dakota	11	860	3	0.	8	0.
Ohio	26	249	6	2.0	20	9.2
Oklahoma	35	944	0	0.	33	6.1
Pennsylvania	122	1,176	29	.2	93	3.5
Tennessee	38	285	2	T.	36	3.9
Texas	176	5,395	24	1.7	153	7.2
Virginia	5	107	0	0	5	10.8
Washington	72	2,359	51	1.2	21	5.7
Wisconsin	139	1,662	27	.5	112	.9
	1,990	35,160	456		1,443	

FIELD, LABORATORY AND GREENHOUSE STUDIES ON THE CEREAL AND FORAGE SMUTS, WITH SPECIAL REFERENCE TO THOSE OF CORN, SORGHUMS, OATS AND WHEAT.

(L. E. Melchers).

Since the cooperative work has been in progress (1911), many data pertaining to the various phases outlined above have accumulated which have not yet been published. Only a brief statement can be made at this time concerning the progress of the work, and calling attention to the investigations under way.

For a number of years, varieties of sorghums have been tested at Manhattan, Kans., and Amarillo, Texas, to determine their susceptibility to kernel and head smuts. It has been found that certain varieties consistently show no infection, others show a low percentage, while still others have as high as 72 per cent kernel smut. Breeding work is being conducted in which resistant varieties are crossed with susceptible varieties, with the intention of studying the inheritance of smut resistance and of securing a hybrid which shows resistance and which is also of value for grain and forage production.

A varietal experiment of corn has also been conducted for a number of years, to determine possible differences in the behavior of different varieties of corn smut. A similar study is being conducted with varieties of oats, in which special attention is given to selections of Burt and Fulghum oats. Both the loose and the covered smuts are being used in the experiments.

In connection with the studies being made with varieties of corn and their behavior to corn smut, plot work is being conducted with the Fusarium root rot disease. Ear-to-row experiments have been made and detailed studies are under way,, to determine the behavior of each row and the development and yield of each plant. Plant records have been kept and a history of each plant is at hand. It is hoped that strains may be developed that will show resistance to corn smut.

A study is being made of the inheritance of the disease-resistant character. The F_1, F_2 and subsequent generations of the corn and xhorghum crosses will be tested for their behavior to smut. In connection with this, special emphasis will be placed on their agronomic value.

Morphologic, cytologic, and physiologic studies are being conducted to discover the difference in behavior between susceptible and resistant varieties of sorghum. It has been found that varieties of sorghums which appear always to be resistant under field conditions, can be made to take sorghum smut by artificial infection. In connection with this work, cytologic investigations of the progress of infection and the histologic changes occurring in the host tissue are in progress.

Ecologic studies have been carried on for a number of years in connection

with the corn smut work. A larger number of cultures have been isolated from the soil and air and from the axils of the corn plant. To date, no detailed study has been made of the behavior of cultures with reference to the influence of the substratum on the growth and development and the influence of temperature and of enzyme production. It has been found that cultures differ considerably in virulence, and that great differences exist in the length of time that cultures can maintain their virulence. This phase will be carried on more extensively in the near future.

Since 1913, various possible methods of controlling corn smut have been tried. This has been in connection with the studies of the life history of the corn smut organism. Various methods of soil, chemical, and fungicidal treatment have been tried with no positive evidence of control. Such fungicides as copper sulphate, Bordeaux mixture, formaldehyde, and lime-sulphur have been used on the corn plant in the form of sprays and otherwise. Such soil treatments as the use of chemicals and heat sterilization have given no evidence of control, but have further confirmed the prevalent idea, namely, that corn smut arises through local infection and is not a systemic disease.

Extensive wheat, oat, barley, and sorghum smut treatments have been conducted, and the results show that the dry formaldehyde treatment can be recommended only for oats and barley. Sorghum smut is not controlled by this treatment.